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(54) Title: METHODS OF DIAGNOSIS OF PROSTATE CANCER, COMPOSITIONS AND METHODS OF SCREENING FOR MODULATORS OF PROSTATE CANCER

(57) Abstract: Described herein are genes whose expression are up-regulated or down-regulated in prostate cancer. Also described are such genes whose expression is further up-regulated or down-regulated in drug-resistant prostate cancer cells. Related methods and compositions that can be used for diagnosis and treatment of prostate cancer are disclosed. Also described herein are methods that can be used to identify modulators of prostate cancer.

METHODS OF DIAGNOSIS OF PROSTATE CANCER, COMPOSITIONS AND METHODS OF SCREENING FOR MODULATORS OF PROSTATE CANCER

CROSS-REFERENCES TO RELATED APPLICATIONS

This application claims priority from the following applications: USSN 09/687,576 filed October 13, 2000, USSN 60/276,791 filed March 16, 2001; USSN 60/288,589, filed May 4, 2001; USSN 09/733,742, filed December 8, 2000; USSN 09/733,288, filed December 8, 2000; USSN 09/847,046, filed April 30, 2001; USSN 60/276,888, filed March 16, 2001; USSN 60/286,214, filed April 24, 2001; USSN 60/281,922, filed April 6, 2001; USSN 60/263,957, filed January 24, 2001, which are incorporated herein by reference in their entirety.

FIELD OF THE INVENTION

The invention relates to the identification of nucleic acid and protein expression profiles and nucleic acids, products, and antibodies thereto that are involved in prostate cancer; and to the use of such expression profiles and compositions in the diagnosis, prognosis and therapy of prostate cancer. The invention further relates to methods for identifying and using agents and/or targets that inhibit prostate cancer.

BACKGROUND OF THE INVENTION

Prostate cancer is the most commonly diagnosed internal malignancy and second most common cause of cancer death in men in the U.S., resulting in approximately 40,000 deaths each year (Landis et al., *CA Cancer J. Clin.* 48:6-29 (1998); Greenlee et al., *CA Cancer J. Clin.* 50(1):7-13 (2000)), and incidence of prostate cancer has been increasing rapidly over the past 20 years in many parts of the world (Nakata et al., *Int. J. Urol.* 7(7):254-257 (2000); Majeed et al., *BJU Int.* 85(9):1058-1062 (2000)). It develops as the

result of a pathologic transformation of normal prostate cells. In tumorigenesis, the cancer cell undergoes initiation, proliferation and loss of contact inhibition, culminating in invasion of surrounding tissue and, ultimately, metastasis.

Deaths from prostate cancer are a result of metastasis of a prostate tumor. Therefore, early detection of the development of prostate cancer is critical in reducing mortality from this disease. Measuring levels of prostate-specific antigen (PSA) has become a very common method for early detection and screening, and may have contributed to the slight decrease in the mortality rate from prostate cancer in recent years (Nowroozi et al., *Cancer Control* 5(6):522-531 (1998)). However, many cases are not diagnosed until the disease has progressed to an advanced stage.

Treatments such as surgery (prostatectomy) , radiation therapy, and cryotherapy are potentially curative when the cancer remains localized to the prostate. Therefore, early detection of prostate cancer is important for a positive prognosis for treatment. Systemic treatment for metastatic prostate cancer is limited to hormone therapy and chemotherapy. Chemical or surgical castration has been the primary treatment for symptomatic metastatic prostate cancer for over 50 years. This testicular androgen deprivation therapy usually results in stabilization or regression of the disease (in 80% of patients), but progression of metastatic prostate cancer eventually develops (Panvichian et al., *Cancer Control* 3(6):493-500 (1996)). Metastatic disease is currently considered incurable, and the primary goals of treatment are to prolong survival and improve quality of life (Rago, *Cancer Control* 5(6):513-521 (1998)).

Thus, methods that can be used for diagnosis and prognosis of prostate cancer and effective treatment of prostate cancer, and including particularly metastatic prostate cancer, would be desirable. Accordingly, provided herein are methods that can be used in diagnosis and prognosis of prostate cancer. Further provided are methods that can be used to screen candidate bioactive agents for the ability to modulate, e.g., treat, prostate cancer. Additionally, provided herein are molecular targets and compositions for therapeutic intervention in prostate cancer and other cancers.

SUMMARY OF THE INVENTION

The present invention therefore provides nucleotide sequences of genes that are up- and down-regulated in prostate cancer cells. Such genes are useful for diagnostic purposes, and also as targets for screening for therapeutic compounds that modulate prostate cancer, such as hormones or antibodies. Other aspects of the invention will become apparent to the skilled artisan by the following description of the invention.

In one aspect, the present invention provides a method of detecting a prostate cancer-associated transcript in a cell from a patient, the method comprising contacting a biological sample from the patient with a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1-16.

In one embodiment, the present invention provides a method of determining the level of a prostate cancer associated transcript in a cell from a patient.

In one embodiment, the present invention provides a method of detecting a prostate cancer-associated transcript in a cell from a patient, the method comprising contacting a biological sample from the patient with a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1-16.

In one embodiment, the polynucleotide selectively hybridizes to a sequence at least 95% identical to a sequence as shown in Tables 1-16. In another embodiment, the polynucleotide comprises a sequence as shown in Tables 1-16.

In one embodiment, the biological sample is a tissue sample. In another embodiment, the biological sample comprises isolated nucleic acids, e.g., mRNA.

In one embodiment, the polynucleotide is labeled, e.g., with a fluorescent label.

In one embodiment, the polynucleotide is immobilized on a solid surface.

In one embodiment, the patient is undergoing a therapeutic regimen to treat prostate cancer. In another embodiment, the patient is suspected of having metastatic prostate cancer.

In one embodiment, the patient is a human.

In one embodiment, the patient is suspected of having a taxol-resistant cancer.

In one embodiment, the prostate cancer associated transcript is mRNA.

In one embodiment, the method further comprises the step of amplifying nucleic acids before the step of contacting the biological sample with the polynucleotide.

In another aspect, the present invention provides a method of monitoring the efficacy of a therapeutic treatment of prostate cancer, the method comprising the steps of: (i) providing a biological sample from a patient undergoing the therapeutic treatment; and (ii) determining the level of a prostate cancer-associated transcript in the biological sample by contacting the biological sample with a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1-16, thereby monitoring the efficacy of the therapy. In a further embodiment, the patient has metastatic prostate cancer. In a further embodiment, the patient has a drug resistant (e.g., taxol resistant) form of prostate cancer.

In one embodiment, the method further comprises the step of: (iii) comparing the level of the prostate cancer-associated transcript to a level of the prostate cancer-associated transcript in a biological sample from the patient prior to, or earlier in, the therapeutic treatment.

Additionally, provided herein is a method of evaluating the effect of a candidate prostate cancer drug comprising administering the drug to a patient and removing a cell sample from the patient. The expression profile of the cell is then determined. This method may further comprise comparing the expression profile to an expression profile of a healthy individual. In a preferred embodiment, said expression profile includes a gene of Tables 1-16.

In one aspect, the present invention provides an isolated nucleic acid molecule consisting of a polynucleotide sequence as shown in Tables 1-16.

In one embodiment, an expression vector or cell comprises the isolated nucleic acid.

In one aspect, the present invention provides an isolated polypeptide which is encoded by a nucleic acid molecule having polynucleotide sequence as shown in Tables 1-16.

In another aspect, the present invention provides an antibody that specifically binds to an isolated polypeptide which is encoded by a nucleic acid molecule having polynucleotide sequence as shown in Tables 1-16.

In one embodiment, the antibody is conjugated to an effector component, e.g., a fluorescent label, a radioisotope or a cytotoxic chemical.

In one embodiment, the antibody is an antibody fragment. In another embodiment, the antibody is humanized.

In one aspect, the present invention provides a method of detecting a prostate cancer cell in a biological sample from a patient, the method comprising contacting the biological sample with an antibody as described herein.

In another aspect, the present invention provides a method of detecting antibodies specific to prostate cancer in a patient, the method comprising contacting a biological sample from the patient with a polypeptide encoded by a nucleic acid comprising a sequence from Tables 1-16.

In another aspect, the present invention provides a method for identifying a compound that modulates a prostate cancer-associated polypeptide, the method comprising the steps of: (i) contacting the compound with a prostate cancer-associated polypeptide, the polypeptide encoded by a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1-16; and (ii) determining the functional effect of the compound upon the polypeptide.

In one embodiment, the functional effect is a physical effect, an enzymatic effect, or a chemical effect.

In one embodiment, the polypeptide is expressed in a eukaryotic host cell or cell membrane. In another embodiment, the polypeptide is recombinant.

In one embodiment, the functional effect is determined by measuring ligand binding to the polypeptide.

In another aspect, the present invention provides a method of inhibiting proliferation of a prostate cancer-associated cell to treat prostate cancer in a patient, the method comprising the step of administering to the subject a therapeutically effective amount of a compound identified as described herein.

In one embodiment, the compound is an antibody.

In another aspect, the present invention provides a drug screening assay comprising the steps of: (i) administering a test compound to a mammal having prostate cancer or to a cell sample isolated therefrom; (ii) comparing the level of gene expression of a

polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1-16 in a treated cell or mammal with the level of gene expression of the polynucleotide in a control cell sample or mammal, wherein a test compound that modulates the level of expression of the polynucleotide is a candidate for the treatment of prostate cancer.

In one embodiment, the control is a mammal with prostate cancer or a cell sample therefrom that has not been treated with the test compound. In another embodiment, the control is a normal cell or mammal.

In one embodiment, the test compound is administered in varying amounts or concentrations. In another embodiment, the test compound is administered for varying time periods. In another embodiment, the comparison can occur after addition or removal of the drug candidate.

In one embodiment, the levels of a plurality of polynucleotides that selectively hybridize to a sequence at least 80% identical to a sequence as shown in Tables 1-16 are individually compared to their respective levels in a control cell sample or mammal. In a preferred embodiment the plurality of polynucleotides is from three to ten.

In another aspect, the present invention provides a method for treating a mammal having prostate cancer comprising administering a compound identified by the assay described herein.

In another aspect, the present invention provides a pharmaceutical composition for treating a mammal having prostate cancer, the composition comprising a compound identified by the assay described herein and a physiologically acceptable excipient.

In one aspect, the present invention provides a method of screening drug candidates by providing a cell expressing a gene that is up- and down-regulated as in a prostate cancer. In one embodiment, a gene is selected from Tables 1-16. The method further includes adding a drug candidate to the cell and determining the effect of the drug candidate on the expression of the expression profile gene.

In one embodiment, the method of screening drug candidates includes comparing the level of expression in the absence of the drug candidate to the level of expression in the presence of the drug candidate, wherein the concentration of the drug

candidate can vary when present, and wherein the comparison can occur after addition or removal of the drug candidate. In a preferred embodiment, the cell expresses at least two expression profile genes. The profile genes may show an increase or decrease.

Also provided is a method of evaluating the effect of a candidate prostate cancer drug comprising administering the drug to a transgenic animal expressing or over-expressing the prostate cancer modulatory protein, or an animal lacking the prostate cancer modulatory protein, for example as a result of a gene knockout.

Moreover, provided herein is a biochip comprising one or more nucleic acid segments of Tables 1-16, wherein the biochip comprises fewer than 1000 nucleic acid probes. Preferably, at least two nucleic acid segments are included. More preferably, at least three nucleic acid segments are included.

Furthermore, a method of diagnosing a disorder associated with prostate cancer is provided. The method comprises determining the expression of a gene of Tables 1-16, in a first tissue type of a first individual, and comparing the distribution to the expression of the gene from a second normal tissue type from the first individual or a second unaffected individual. A difference in the expression indicates that the first individual has a disorder associated with prostate cancer.

In a further embodiment, the biochip also includes a polynucleotide sequence of a gene that is not up- and down-regulated in prostate cancer.

In one embodiment a method for screening for a bioactive agent capable of interfering with the binding of a prostate cancer modulating protein (prostate cancer modulatory protein) or a fragment thereof and an antibody which binds to said prostate cancer modulatory protein or fragment thereof. In a preferred embodiment, the method comprises combining a prostate cancer modulatory protein or fragment thereof, a candidate bioactive agent and an antibody which binds to said prostate cancer modulatory protein or fragment thereof. The method further includes determining the binding of said prostate cancer modulatory protein or fragment thereof and said antibody. Wherein there is a change in binding, an agent is identified as an interfering agent. The interfering agent can be an agonist or an antagonist. Preferably, the agent inhibits prostate cancer.

Also provided herein are methods of eliciting an immune response in an individual. In one embodiment a method provided herein comprises administering to an

individual a composition comprising a prostate cancer modulating protein, or a fragment thereof. In another embodiment, the protein is encoded by a nucleic acid selected from those of Tables 1-16.

Further provided herein are compositions capable of eliciting an immune response in an individual. In one embodiment, a composition provided herein comprises a prostate cancer modulating protein, preferably encoded by a nucleic acid of Tables 1-16, or a fragment thereof, and a pharmaceutically acceptable carrier. In another embodiment, said composition comprises a nucleic acid comprising a sequence encoding a prostate cancer modulating protein, preferably selected from the nucleic acids of Tables 1-16, and a pharmaceutically acceptable carrier.

Also provided are methods of neutralizing the effect of a prostate cancer protein, or a fragment thereof, comprising contacting an agent specific for said protein with said protein in an amount sufficient to effect neutralization. In another embodiment, the protein is encoded by a nucleic acid selected from those of Tables 1-16.

In another aspect of the invention, a method of treating an individual for prostate cancer is provided. In one embodiment, the method comprises administering to said individual an inhibitor of a prostate cancer modulating protein. In another embodiment, the method comprises administering to a patient having prostate cancer an antibody to a prostate cancer modulating protein conjugated to a therapeutic moiety. Such a therapeutic moiety can be a cytotoxic agent or a radioisotope.

DETAILED DESCRIPTION OF THE INVENTION

In accordance with the objects outlined above, the present invention provides novel methods for diagnosis and prognosis evaluation for prostate cancer (PC), including metastatic prostate cancer, as well as methods for screening for compositions which modulate prostate cancer. Also provided are methods for treating prostate cancer.

In addition to the other nucleic acid and peptide sequences, the present invention also relates to the identification of PAA2 as a gene that is highly over expressed in prostate cancer patient tissues. PAA2 sequence is identical to the zinc transporter ZNT4. Results presented herein demonstrate that PAA2/ZNT4 is highly expressed in prostate cancer cells. The prostate gland is unique in that it has the highest capacity of any organ in the body

to accumulate zinc. Zinc uptake is regulated by prolactin and testosterone, which induce the expression of a member of the ZIP family of zinc transporters (Costello et al., 1999, J. Biol. Chem. 274:17499-17504). Zinc accumulation in the prostate functions to inhibit citrate oxidation, which results in a decrease in cellular ATP production (Costello and Franklin, 1998, Prostate 35:285-296). Cancer cells are more sensitive to decreased ATP production and have evolved to prevent zinc accumulation. Without wishing to be bound by theory, the up-regulation of ZNT4 in prostate cancer cells may result in protection of the cells from high zinc levels by its ability to pump accumulated zinc out of the cells.

The present invention also relates to nucleic acid sequencess encoding PBH1. PBH1 is related to human TRPC7 (transient receptor potential-related channels, NP_003298), a putative calcium channel highly expressed in brain (Nagamine et al., Genomics 54:124-131 (1998)). Trp is related to melastatin, a gene down-regulated in metastatic melanomas (Duncan et al., Cancer Res. 58:1515-1520 (1998)), and MTR1, a gene locallized to within the Beckwith-Wiedemann syndrome/Wilm's tumor susceptability region (Prawitt et al., Hum. Mol. Genet. 9:203-216 (2000)). Without wishing to be bound by theory, it is believed that PBH1 functions as a calcium channel.

As a calcium channel, PBH1 is an ideal target for a small molecule therapeutic, or a therapeutic antibody that disrupts channel function. CD20, the target of Rituximab in non-Hodgekin's lymphoma (Maloney et al., Blood 90:2188-2195 (1997); Leget and Czuczman, Curr. Opin. Oncol. 10:548-551 (1998)), is a plasma membrane calcium channel expressed in B cells (Tedder and Engel, Immunol. Today 15:450-454 (1994)). Similarly, a small molecule, or antibody that inhibits or alters a calcium signal mediated by PBH1, will result in the death of prostate cancer cells.

PBH1, and other genes of the invention, are also be useful as targets for cytotoxic T-lymphocytes. Genes that are tumor specific, or that are expressed in immune-privileged organs, are currently being used as potential vaccine targets (Van den Eynde and Boon, Int. J. Clin. Lab. Res. 27:81-86 (1997)). The expression pattern of PBH1 indicates that it is an ideal target for cytotoxic T-lymphocytes. Thus, therapies that utilize PBH1-specific cytotoxic T-lymphocytes to induce prostate cancer cell death are also provided by this invention. See, e.g., U.S. Patent No. 6,051,227 and WO 00/32231, the disclosures of which are herein incorporated by reference.

The present invention is also related to the identification of PAA3 as a gene that is important in the modulation of prostate cancer and or breast cancer.

Tables 1-16 provide unigene cluster identification numbers, exemplar accession numbers, or genomic nucleotide position numbers for the nucleotide sequence of genes that exhibit increased or decreased expression in prostate cancer samples.

Definitions

The term "prostate cancer protein" or "prostate cancer polynucleotide" or "prostate cancer-associated transcript" refers to nucleic acid and polypeptide polymorphic variants, alleles, mutants, and interspecies homologues that: (1) have a nucleotide sequence that has greater than about 60% nucleotide sequence identity, 65%, 70%, 75%, 80%, 85%, 90%, preferably 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% or greater nucleotide sequence identity, preferably over a region of over a region of at least about 25, 50, 100, 200, 500, 1000, or more nucleotides, to a nucleotide sequence of or associated with a unigene cluster of Tables 1-16; (2) bind to antibodies, e.g., polyclonal antibodies, raised against an immunogen comprising an amino acid sequence encoded by a nucleotide sequence of or associated with a unigene cluster of Tables 1-16, and conservatively modified variants thereof; (3) specifically hybridize under stringent hybridization conditions to a nucleic acid sequence, or the complement thereof of Tables 1-16 and conservatively modified variants thereof or (4) have an amino acid sequence that has greater than about 60% amino acid sequence identity, 65%, 70%, 75%, 80%, 85%, 90%, preferably 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% or greater amino sequence identity, preferably over a region of over a region of at least about 25, 50, 100, 200, 500, 1000, or more amino acid, to an amino acid sequence encoded by a nucleotide sequence of or associated with a unigene cluster of Tables 1-16. A polynucleotide or polypeptide sequence is typically from a mammal including, but not limited to, primate, e.g., human; rodent, e.g., rat, mouse, hamster; cow, pig, horse, sheep, or other mammal. A "prostate cancer polypeptide" and a "prostate cancer polynucleotide," include both naturally occurring or recombinant forms.

A "full length" prostate cancer protein or nucleic acid refers to a prostate cancer polypeptide or polynucleotide sequence, or a variant thereof, that contains all of the elements normally contained in one or more naturally occurring, wild type prostate cancer

polynucleotide or polypeptide sequences. For example, a full length prostate cancer nucleic acid will typically comprise all of the exons that encode for the full length, naturally ocurring protein. The "full length" may be prior to, or after, various stages of post-translation processing or splicing, including alternative splicing.

"Biological sample" as used herein is a sample of biological tissue or fluid that contains nucleic acids or polypeptides, e.g., of a prostate cancer protein, polynucleotide or transcript. Such samples include, but are not limited to, tissue isolated from primates, e.g., humans, or rodents, e.g., mice, and rats. Biological samples may also include sections of tissues such as biopsy and autopsy samples, frozen sections taken for histologic purposes, blood, plasma, serum, sputum, stool, tears, mucus, hair, skin, etc. Biological samples also include explants and primary and/or transformed cell cultures derived from patient tissues. A biological sample is typically obtained from a eukaryotic organism, most preferably a mammal such as a primate e.g., chimpanzee or human; cow; dog; cat; a rodent, e.g., guinea pig, rat, mouse; rabbit; or a bird; reptile; or fish.

"Providing a biological sample" means to obtain a biological sample for use in methods described in this invention. Most often, this will be done by removing a sample of cells from an animal, but can also be accomplished by using previously isolated cells (*e.g.*, isolated by another person, at another time, and/or for another purpose), or by performing the methods of the invention *in vivo*. Archival tissues, having treatment or outcome history, will be particularly useful.

The terms "identical" or percent "identity," in the context of two or more nucleic acids or polypeptide sequences, refer to two or more sequences or subsequences that are the same or have a specified percentage of amino acid residues or nucleotides that are the same (i.e., about 60% identity, preferably 70%, 75%, 80%, 85%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99%, or higher identity over a specified region, when compared and aligned for maximum correspondence over a comparison window or designated region) as measured using a BLAST or BLAST 2.0 sequence comparison algorithms with default parameters described below, or by manual alignment and visual inspection (*see, e.g.*, NCBI web site http://www.ncbi.nlm.nih.gov/BLAST/ or the like). Such sequences are then said to be "substantially identical." This definition also refers to, or may be applied to, the compliment of a test sequence. The definition also includes sequences that have deletions

and/or additions, as well as those that have substitutions, as well as naturally occurring, e.g., polymorphic or allelic variants, and man-made variants. As described below, the preferred algorithms can account for gaps and the like. Preferably, identity exists over a region that is at least about 25 amino acids or nucleotides in length, or more preferably over a region that is 50-100 amino acids or nucleotides in length.

For sequence comparison, typically one sequence acts as a reference sequence, to which test sequences are compared. When using a sequence comparison algorithm, test and reference sequences are entered into a computer, subsequence coordinates are designated, if necessary, and sequence algorithm program parameters are designated. Preferably, default program parameters can be used, or alternative parameters can be designated. The sequence comparison algorithm then calculates the percent sequence identities for the test sequences relative to the reference sequence, based on the program parameters.

A "comparison window", as used herein, includes reference to a segment of one of the number of contiguous positions selected from the group consisting typically of from 20 to 600, usually about 50 to about 200, more usually about 100 to about 150 in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned. Methods of alignment of sequences for comparison are well-known in the art. Optimal alignment of sequences for comparison can be conducted, e.g., by the local homology algorithm of Smith & Waterman, *Adv. Appl. Math.* 2:482 (1981), by the homology alignment algorithm of Needleman & Wunsch, *J. Mol. Biol.* 48:443 (1970), by the search for similarity method of Pearson & Lipman, *Proc. Nat'l. Acad. Sci. USA* 85:2444 (1988), by computerized implementations of these algorithms (GAP, BESTFIT, FASTA, and TFASTA in the Wisconsin Genetics Software Package, Genetics Computer Group, 575 Science Dr., Madison, WI), or by manual alignment and visual inspection (*see, e.g., Current Protocols in Molecular Biology* (Ausubel *et al.*, eds. 1995 supplement)).

Preferred examples of algorithms that are suitable for determining percent sequence identity and sequence similarity include the BLAST and BLAST 2.0 algorithms, which are described in Altschul *et al., Nuc. Acids Res.* 25:3389-3402 (1977) and Altschul *et al., J. Mol. Biol.* 215:403-410 (1990). BLAST and BLAST 2.0 are used, with the parameters described herein, to determine percent sequence identity for the nucleic acids and proteins of

the invention. Software for performing BLAST analyses is publicly available through the National Center for Biotechnology Information (http://www.ncbi.nlm.nih.gov/). This algorithm involves first identifying high scoring sequence pairs (HSPs) by identifying short words of length W in the query sequence, which either match or satisfy some positive-valued threshold score T when aligned with a word of the same length in a database sequence. T is referred to as the neighborhood word score threshold (Altschul *et al.*, *supra*). These initial neighborhood word hits act as seeds for initiating searches to find longer HSPs containing them. The word hits are extended in both directions along each sequence for as far as the cumulative alignment score can be increased. Cumulative scores are calculated using, e.g., for nucleotide sequences, the parameters M (reward score for a pair of matching residues; always > 0) and N (penalty score for mismatching residues; always < 0). For amino acid sequences, a scoring matrix is used to calculate the cumulative score. Extension of the word hits in each direction are halted when: the cumulative alignment score falls off by the quantity X from its maximum achieved value; the cumulative score goes to zero or below, due to the accumulation of one or more negative-scoring residue alignments; or the end of either sequence is reached. The BLAST algorithm parameters W, T, and X determine the sensitivity and speed of the alignment. The BLASTN program (for nucleotide sequences) uses as defaults a wordlength (W) of 11, an expectation (E) of 10, M=5, N=-4 and a comparison of both strands. For amino acid sequences, the BLASTP program uses as defaults a wordlength of 3, and expectation (E) of 10, and the BLOSUM62 scoring matrix (*see* Henikoff & Henikoff, *Proc. Natl. Acad. Sci. USA* 89:10915 (1989)) alignments (B) of 50, expectation (E) of 10, M=5, N=-4, and a comparison of both strands.

The BLAST algorithm also performs a statistical analysis of the similarity between two sequences (*see, e.g.*, Karlin & Altschul, *Proc. Nat'l. Acad. Sci. USA* 90:5873-5787 (1993)). One measure of similarity provided by the BLAST algorithm is the smallest sum probability (P(N)), which provides an indication of the probability by which a match between two nucleotide or amino acid sequences would occur by chance. For example, a nucleic acid is considered similar to a reference sequence if the smallest sum probability in a comparison of the test nucleic acid to the reference nucleic acid is less than about 0.2, more preferably less than about 0.01, and most preferably less than about 0.001. Log values may be large negative numbers, e.g., 5, 10, 20, 30, 40, 40, 70, 90, 110, 150, 170, etc.

An indication that two nucleic acid sequences or polypeptides are substantially identical is that the polypeptide encoded by the first nucleic acid is immunologically cross reactive with the antibodies raised against the polypeptide encoded by the second nucleic acid, as described below. Thus, a polypeptide is typically substantially identical to a second polypeptide, e.g., where the two peptides differ only by conservative substitutions. Another indication that two nucleic acid sequences are substantially identical is that the two molecules or their complements hybridize to each other under stringent conditions, as described below. Yet another indication that two nucleic acid sequences are substantially identical is that the same primers can be used to amplify the sequences.

A "host cell" is a naturally occurring cell or a transformed cell that contains an expression vector and supports the replication or expression of the expression vector. Host cells may be cultured cells, explants, cells *in vivo*, and the like. Host cells may be prokaryotic cells such as *E. coli*, or eukaryotic cells such as yeast, insect, amphibian, or mammalian cells such as CHO, HeLa, and the like (*see, e.g.,* the American Type Culture Collection catalog or web site, www.atcc.org).

The terms "isolated," "purified," or "biologically pure" refer to material that is substantially or essentially free from components that normally accompany it as found in its native state. Purity and homogeneity are typically determined using analytical chemistry techniques such as polyacrylamide gel electrophoresis or high performance liquid chromatography. A protein or nucleic acid that is the predominant species present in a preparation is substantially purified. In particular, an isolated nucleic acid is separated from some open reading frames that naturally flank the gene and encode proteins other than protein encoded by the gene. The term "purified" in some embodiments denotes that a nucleic acid or protein gives rise to essentially one band in an electrophoretic gel. Preferably, it means that the nucleic acid or protein is at least 85% pure, more preferably at least 95% pure, and most preferably at least 99% pure. "Purify" or "purification" in other embodiments means removing at least one contaminant from the composition to be purified. In this sense, purification does not require that the purified compound be homogenous, e.g., 100% pure.

The terms "polypeptide," "peptide" and "protein" are used interchangeably herein to refer to a polymer of amino acid residues. The terms apply to amino acid polymers in which one or more amino acid residue is an artificial chemical mimetic of a corresponding

naturally occurring amino acid, as well as to naturally occurring amino acid polymers, those containing modified residues, and non-naturally occurring amino acid polymer.

The term "amino acid" refers to naturally occurring and synthetic amino acids, as well as amino acid analogs and amino acid mimetics that function similarly to the naturally occurring amino acids. Naturally occurring amino acids are those encoded by the genetic code, as well as those amino acids that are later modified, e.g., hydroxyproline, γ-carboxyglutamate, and O-phosphoserine. Amino acid analogs refers to compounds that have the same basic chemical structure as a naturally occurring amino acid, e.g., an α carbon that is bound to a hydrogen, a carboxyl group, an amino group, and an R group, e.g., homoserine, norleucine, methionine sulfoxide, methionine methyl sulfonium. Such analogs may have modified R groups (e.g., norleucine) or modified peptide backbones, but retain the same basic chemical structure as a naturally occurring amino acid. Amino acid mimetics refers to chemical compounds that have a structure that is different from the general chemical structure of an amino acid, but that functions similarly to a naturally occurring amino acid.

Amino acids may be referred to herein by either their commonly known three letter symbols or by the one-letter symbols recommended by the IUPAC-IUB Biochemical Nomenclature Commission. Nucleotides, likewise, may be referred to by their commonly accepted single-letter codes.

"Conservatively modified variants" applies to both amino acid and nucleic acid sequences. With respect to particular nucleic acid sequences, conservatively modified variants refers to those nucleic acids which encode identical or essentially identical amino acid sequences, or where the nucleic acid does not encode an amino acid sequence, to essentially identical or associated, e.g., naturally contiguous, sequences. Because of the degeneracy of the genetic code, a large number of functionally identical nucleic acids encode most proteins. For instance, the codons GCA, GCC, GCG and GCU all encode the amino acid alanine. Thus, at every position where an alanine is specified by a codon, the codon can be altered to another of the corresponding codons described without altering the encoded polypeptide. Such nucleic acid variations are "silent variations," which are one species of conservatively modified variations. Every nucleic acid sequence herein which encodes a polypeptide also describes silent variations of the nucleic acid. One of skill will recognize that in certain contexts each codon in a nucleic acid (except AUG, which is ordinarily the

only codon for methionine, and TGG, which is ordinarily the only codon for tryptophan) can be modified to yield a functionally identical molecule. Accordingly, often silent variations of a nucleic acid which encodes a polypeptide is implicit in a described sequence with respect to the expression product, but not with respect to actual probe sequences.

As to amino acid sequences, one of skill will recognize that individual substitutions, deletions or additions to a nucleic acid, peptide, polypeptide, or protein sequence which alters, adds or deletes a single amino acid or a small percentage of amino acids in the encoded sequence is a "conservatively modified variant" where the alteration results in the substitution of an amino acid with a chemically similar amino acid. Conservative substitution tables providing functionally similar amino acids are well known in the art. Such conservatively modified variants are in addition to and do not exclude polymorphic variants, interspecies homologs, and alleles of the invention.typically conservative substitutions for one another: 1) Alanine (A), Glycine (G); 2) Aspartic acid (D), Glutamic acid (E); 3) Asparagine (N), Glutamine (Q); 4) Arginine (R), Lysine (K); 5) Isoleucine (I), Leucine (L), Methionine (M), Valine (V); 6) Phenylalanine (F), Tyrosine (Y), Tryptophan (W); 7) Serine (S), Threonine (T); and 8) Cysteine (C), Methionine (M) (*see, e.g.,* Creighton, *Proteins* (1984)).

Macromolecular structures such as polypeptide structures can be described in terms of various levels of organization. For a general discussion of this organization, *see, e.g.,* Alberts *et al.*, *Molecular Biology of the Cell* (3rd ed., 1994) and Cantor & Schimmel, *Biophysical Chemistry Part I: The Conformation of Biological Macromolecules* (1980). "Primary structure" refers to the amino acid sequence of a particular peptide. "Secondary structure" refers to locally ordered, three dimensional structures within a polypeptide. These structures are commonly known as domains. Domains are portions of a polypeptide that often form a compact unit of the polypeptide and are typically 25 to approximately 500 amino acids long. Typical domains are made up of sections of lesser organization such as stretches of β-sheet and α-helices. "Tertiary structure" refers to the complete three dimensional structure of a polypeptide monomer. "Quaternary structure" refers to the three dimensional structure formed, usually by the noncovalent association of independent tertiary units. Anisotropic terms are also known as energy terms.

"Nucleic acid" or "oligonucleotide" or "polynucleotide" or grammatical equivalents used herein means at least two nucleotides covalently linked together. Oligonucleotides are typically from about 5, 6, 7, 8, 9, 10, 12, 15, 25, 30, 40, 50 or more nucleotides in length, up to about 100 nucleotides in length. Nucleic acids and polynucleotides are a polymers of any length, including longer lengths, e.g., 200, 300, 500, 1000, 2000, 3000, 5000, 7000, 10,000, etc. A nucleic acid of the present invention will generally contain phosphodiester bonds, although in some cases, nucleic acid analogs are included that may have alternate backbones, comprising, e.g., phosphoramidate, phosphorothioate, phosphorodithioate, or O-methylphophoroamidite linkages (see Eckstein, Oligonucleotides and Analogues: A Practical Approach, Oxford University Press); and peptide nucleic acid backbones and linkages. Other analog nucleic acids include those with positive backbones; non-ionic backbones, and non-ribose backbones, including those described in U.S. Patent Nos. 5,235,033 and 5,034,506, and Chapters 6 and 7, ASC Symposium Series 580, *Carbohydrate Modifications in Antisense Research*, Sanghui & Cook, eds.. Nucleic acids containing one or more carbocyclic sugars are also included within one definition of nucleic acids. Modifications of the ribose-phosphate backbone may be done for a variety of reasons, e.g. to increase the stability and half-life of such molecules in physiological environments or as probes on a biochip. Mixtures of naturally occurring nucleic acids and analogs can be made; alternatively, mixtures of different nucleic acid analogs, and mixtures of naturally occurring nucleic acids and analogs may be made.

A variety of references disclose such nucleic acid analogs, including, for example, phosphoramidate (Beaucage et al., Tetrahedron 49(10):1925 (1993) and references therein; Letsinger, J. Org. Chem. 35:3800 (1970); Sprinzl et al., Eur. J. Biochem. 81:579 (1977); Letsinger et al., Nucl. Acids Res. 14:3487 (1986); Sawai et al, Chem. Lett. 805 (1984), Letsinger et al., J. Am. Chem. Soc. 110:4470 (1988); and Pauwels et al., Chemica Scripta 26:141 91986)), phosphorothioate (Mag et al., Nucleic Acids Res. 19:1437 (1991); and U.S. Patent No. 5,644,048), phosphorodithioate (Briu et al., J. Am. Chem. Soc. 111:2321 (1989), O-methylphophoroamidite linkages (see Eckstein, Oligonucleotides and Analogues: A Practical Approach, Oxford University Press), and peptide nucleic acid backbones and linkages (see Egholm, J. Am. Chem. Soc. 114:1895 (1992); Meier et al., Chem. Int. Ed. Engl. 31:1008 (1992); Nielsen, Nature, 365:566 (1993); Carlsson et al., Nature 380:207 (1996), all

of which are incorporated by reference). Other analog nucleic acids include those with positive backbones (Denpcy et al., Proc. Natl. Acad. Sci. USA 92:6097 (1995); non-ionic backbones (U.S. Patent Nos. 5,386,023, 5,637,684, 5,602,240, 5,216,141 and 4,469,863; Kiedrowshi et al., Angew. Chem. Intl. Ed. English 30:423 (1991); Letsinger et al., J. Am. Chem. Soc. 110:4470 (1988); Letsinger et al., Nucleoside & Nucleotide 13:1597 (1994); Chapters 2 and 3, ASC Symposium Series 580, "Carbohydrate Modifications in Antisense Research", Ed. Y.S. Sanghui and P. Dan Cook; Mesmaeker et al., Bioorganic & Medicinal Chem. Lett. 4:395 (1994); Jeffs et al., J. Biomolecular NMR 34:17 (1994); Tetrahedron Lett. 37:743 (1996)) and non-ribose backbones, including those described in U.S. Patent Nos. 5,235,033 and 5,034,506, and Chapters 6 and 7, ASC Symposium Series 580, "Carbohydrate Modifications in Antisense Research", Ed. Y.S. Sanghui and P. Dan Cook. Nucleic acids containing one or more carbocyclic sugars are also included within one definition of nucleic acids (see Jenkins et al., Chem. Soc. Rev. (1995) pp 169-176). Several nucleic acid analogs are described in Rawls, C & E News June 2, 1997 page 35. All of these references are hereby expressly incorporated by reference.

Particularly preferred are peptide nucleic acids (PNA) which includes peptide nucleic acid analogs. These backbones are substantially non-ionic under neutral conditions, in contrast to the highly charged phosphodiester backbone of naturally occurring nucleic acids. This results in two advantages. First, the PNA backbone exhibits improved hybridization kinetics. PNAs have larger changes in the melting temperature (T_m) for mismatched versus perfectly matched basepairs. DNA and RNA typically exhibit a 2-4°C drop in T_m for an internal mismatch. With the non-ionic PNA backbone, the drop is closer to 7-9°C. Similarly, due to their non-ionic nature, hybridization of the bases attached to these backbones is relatively insensitive to salt concentration. In addition, PNAs are not degraded by cellular enzymes, and thus can be more stable.

The nucleic acids may be single stranded or double stranded, as specified, or contain portions of both double stranded or single stranded sequence. As will be appreciated by those in the art, the depiction of a single strand also defines the sequence of the complementary strand; thus the sequences described herein also provide the complement of the sequence. The nucleic acid may be DNA, both genomic and cDNA, RNA or a hybrid, where the nucleic acid may contain combinations of deoxyribo- and ribo-nucleotides, and

combinations of bases, including uracil, adenine, thymine, cytosine, guanine, inosine, xanthine hypoxanthine, isocytosine, isoguanine, etc. "Transcript" typically refers to a naturally occurring RNA, e.g., a pre-mRNA, hnRNA, or mRNA. As used herein, the term "nucleoside" includes nucleotides and nucleoside and nucleotide analogs, and modified nucleosides such as amino modified nucleosides. In addition, "nucleoside" includes non-naturally occurring analog structures. Thus, e.g. the individual units of a peptide nucleic acid, each containing a base, are referred to herein as a nucleoside.

A "label" or a "detectable moiety" is a composition detectable by spectroscopic, photochemical, biochemical, immunochemical, chemical, or other physical means. For example, useful labels include fluorescent dyes, electron-dense reagents, enzymes (*e.g.*, as commonly used in an ELISA), biotin, digoxigenin, or haptens and proteins or other entities which can be made detectable, *e.g.*, by incorporating a radiolabel into the peptide or used to detect antibodies specifically reactive with the peptide. The radioisotope may be, for example, 3H, 14C, 32P, 35S, or 125I. In some cases, particularly using antibodies against the proteins of the invention, the radioisotopes are used as toxic moieties, as described below. The labels may be incorporated into the prostate cancer nucleic acids, proteins and antibodies at any position. Any method known in the art for conjugating the antibody to the label may be employed, including those methods described by Hunter et al., Nature, 144:945 (1962); David et al., Biochemistry, 13:1014 (1974); Pain et al., J. Immunol. Meth., 40:219 (1981); and Nygren, J. Histochem. and Cytochem., 30:407 (1982). The lifetime of radiolabeled peptides or radiolabeled antibody compositions may extended by the addition of substances that stablize the radiolabeled peptide or antibody and protect it from degradation. Any substance or combination of substances that stablize the radiolabeled peptide or antibody may be used including those substances disclosed in US Patent No. 5,961,955.

An "effector" or "effector moiety" or "effector component" is a molecule that is bound (or linked, or conjugated), either covalently, through a linker or a chemical bond, or noncovalently, through ionic, van der Waals, electrostatic, or hydrogen bonds, to an antibody. The "effector" can be a variety of molecules including, e.g., detection moieties including radioactive compounds, fluorescent compounds, an enzyme or substrate, tags such as epitope tags, a toxin; activatable moieties, a chemotherapeutic agent; a lipase; an antibiotic; or a radioisotope emitting "hard" e.g., beta radiation.

A "labeled nucleic acid probe or oligonucleotide" is one that is bound, either covalently, through a linker or a chemical bond, or noncovalently, through ionic, van der Waals, electrostatic, or hydrogen bonds to a label such that the presence of the probe may be detected by detecting the presence of the label bound to the probe. Alternatively, method using high affinity interactions may achieve the same results where one of a pair of binding partners binds to the other, e.g., biotin, streptavidin.

As used herein a "nucleic acid probe or oligonucleotide" is defined as a nucleic acid capable of binding to a target nucleic acid of complementary sequence through one or more types of chemical bonds, usually through complementary base pairing, usually through hydrogen bond formation. As used herein, a probe may include natural (i.e., A, G, C, or T) or modified bases (7-deazaguanosine, inosine, etc.). In addition, the bases in a probe may be joined by a linkage other than a phosphodiester bond, so long as it does not functionally interfere with hybridization. Thus, e.g., probes may be peptide nucleic acids in which the constituent bases are joined by peptide bonds rather than phosphodiester linkages. It will be understood by one of skill in the art that probes may bind target sequences lacking complete complementarity with the probe sequence depending upon the stringency of the hybridization conditions. The probes are preferably directly labeled as with isotopes, chromophores, lumiphores, chromogens, or indirectly labeled such as with biotin to which a streptavidin complex may later bind. By assaying for the presence or absence of the probe, one can detect the presence or absence of the select sequence or subsequence. Diagnosis or prognosis may be based at the genomic level, or at the level of RNA or protein expression.

The term "recombinant" when used with reference, e.g., to a cell, or nucleic acid, protein, or vector, indicates that the cell, nucleic acid, protein or vector, has been modified by the introduction of a heterologous nucleic acid or protein or the alteration of a native nucleic acid or protein, or that the cell is derived from a cell so modified. Thus, e.g., recombinant cells express genes that are not found within the native (non-recombinant) form of the cell or express native genes that are otherwise abnormally expressed, under expressed or not expressed at all. By the term "recombinant nucleic acid" herein is meant nucleic acid, originally formed *in vitro*, in general, by the manipulation of nucleic acid, e.g., using polymerases and endonucleases, in a form not normally found in nature. In this manner, operably linkage of different sequences is achieved. Thus an isolated nucleic acid, in a linear

form, or an expression vector formed *in vitro* by ligating DNA molecules that are not normally joined, are both considered recombinant for the purposes of this invention. It is understood that once a recombinant nucleic acid is made and reintroduced into a host cell or organism, it will replicate non-recombinantly, i.e., using the *in vivo* cellular machinery of the host cell rather than *in vitro* manipulations; however, such nucleic acids, once produced recombinantly, although subsequently replicated non-recombinantly, are still considered recombinant for the purposes of the invention. Similarly, a "recombinant protein" is a protein made using recombinant techniques, i.e., through the expression of a recombinant nucleic acid as depicted above.

The term "heterologous" when used with reference to portions of a nucleic acid indicates that the nucleic acid comprises two or more subsequences that are not normally found in the same relationship to each other in nature. For instance, the nucleic acid is typically recombinantly produced, having two or more sequences, e.g., from unrelated genes arranged to make a new functional nucleic acid, e.g., a promoter from one source and a coding region from another source. Similarly, a heterologous protein will often refer to two or more subsequences that are not found in the same relationship to each other in nature (e.g., a fusion protein).

A "promoter" is defined as an array of nucleic acid control sequences that direct transcription of a nucleic acid. As used herein, a promoter includes necessary nucleic acid sequences near the start site of transcription, such as, in the case of a polymerase II type promoter, a TATA element. A promoter also optionally includes distal enhancer or repressor elements, which can be located as much as several thousand base pairs from the start site of transcription. A "constitutive" promoter is a promoter that is active under most environmental and developmental conditions. An "inducible" promoter is a promoter that is active under environmental or developmental regulation. The term "operably linked" refers to a functional linkage between a nucleic acid expression control sequence (such as a promoter, or array of transcription factor binding sites) and a second nucleic acid sequence, wherein the expression control sequence directs transcription of the nucleic acid corresponding to the second sequence.

An "expression vector" is a nucleic acid construct, generated recombinantly or synthetically, with a series of specified nucleic acid elements that permit transcription of a

particular nucleic acid in a host cell. The expression vector can be part of a plasmid, virus, or nucleic acid fragment. Typically, the expression vector includes a nucleic acid to be transcribed operably linked to a promoter.

The phrase "selectively (or specifically) hybridizes to" refers to the binding, duplexing, or hybridizing of a molecule only to a particular nucleotide sequence that is determinative of the presence of the nucleotide sequence, in a heterogeneous population of nucleic acids and other biologics (e.g., total cellular or library DNA or RNA). Similarly, the phrase "specifically (or selectively) binds" to an antibody or "specifically (or selectively) immunoreactive with," when referring to a protein or peptide, refers to a binding reaction that is determinative of the presence of the protein, in a heterogeneous population of proteins and other biologics. Thus, under designated immunoassay or nucleic acid hybridization conditions, the specified antibodies or nucleic acid probes bind to a particular protein nucleotide sequences at least two times the background and more typically more than 10 to 100 times background.

Specific binding to an antibody under such conditions requires an antibody that is selected for its specificity for a particular protein. For example, polyclonal antibodies raised to a particular protein, polymorphic variants, alleles, orthologs, and conservatively modified variants, or splice variants, or portions thereof, can be selected to obtain only those polyclonal antibodies that are specifically immunoreactive with the desired prostact cancer protein and not with other proteins. This selection may be achieved by subtracting out antibodies that cross-react with other molecules. A variety of immunoassay formats may be used to select antibodies specifically immunoreactive with a particular protein. For example, solid-phase ELISA immunoassays are routinely used to select antibodies specifically immunoreactive with a protein (*see, e.g.*, Harlow & Lane, *Antibodies, A Laboratory Manual* (1988) for a description of immunoassay formats and conditions that can be used to determine specific immunoreactivity).

The phrase "stringent hybridization conditions" refers to conditions under which a probe will hybridize to its target subsequence, typically in a complex mixture of nucleic acids, but to no other sequences. Stringent conditions are sequence-dependent and will be different in different circumstances. Longer sequences hybridize specifically at higher temperatures. An extensive guide to the hybridization of nucleic acids is found in

Tijssen, *Techniques in Biochemistry and Molecular Biology--Hybridization with Nucleic Probes*, "Overview of principles of hybridization and the strategy of nucleic acid assays" (1993). Generally, stringent conditions are selected to be about 5-10°C lower than the thermal melting point (T_m) for the specific sequence at a defined ionic strength pH. The T_m is the temperature (under defined ionic strength, pH, and nucleic concentration) at which 50% of the probes complementary to the target hybridize to the target sequence at equilibrium (as the target sequences are present in excess, at T_m, 50% of the probes are occupied at equilibrium). Stringent conditions will be those in which the salt concentration is less than about 1.0 M sodium ion, typically about 0.01 to 1.0 M sodium ion concentration (or other salts) at pH 7.0 to 8.3 and the temperature is at least about 30°C for short probes (e.g., 10 to 50 nucleotides) and at least about 60°C for long probes (e.g., greater than 50 nucleotides). Stringent conditions may also be achieved with the addition of destabilizing agents such as formamide. For selective or specific hybridization, a positive signal is at least two times background, preferably 10 times background hybridization. Exemplary stringent hybridization conditions can be as following: 50% formamide, 5x SSC, and 1% SDS, incubating at 42°C, or, 5x SSC, 1% SDS, incubating at 65°C, with wash in 0.2x SSC, and 0.1% SDS at 65°C. For PCR, a temperature of about 36°C is typical for low stringency amplification, although annealing temperatures may vary between about 32°C and 48°C depending on primer length. For high stringency PCR amplification, a temperature of about 62°C is typical, although high stringency annealing temperatures can range from about 50°C to about 65°C, depending on the primer length and specificity. Typical cycle conditions for both high and low stringency amplifications include a denaturation phase of 90°C - 95°C for 30 sec - 2 min., an annealing phase lasting 30 sec. - 2 min., and an extension phase of about 72°C for 1 - 2 min. Protocols and guidelines for low and high stringency amplification reactions are provided, e.g., in Innis *et al.* (1990) *PCR Protocols, A Guide to Methods and Applications*, Academic Press, Inc. N.Y.).

Nucleic acids that do not hybridize to each other under stringent conditions are still substantially identical if the polypeptides which they encode are substantially identical. This occurs, e.g., when a copy of a nucleic acid is created using the maximum codon degeneracy permitted by the genetic code. In such cases, the nucleic acids typically hybridize

under moderately stringent hybridization conditions. Exemplary "moderately stringent hybridization conditions" include a hybridization in a buffer of 40% formamide, 1 M NaCl, 1% SDS at 37°C, and a wash in 1X SSC at 45°C. A positive hybridization is at least twice background. Those of ordinary skill will readily recognize that alternative hybridization and wash conditions can be utilized to provide conditions of similar stringency. Additional guidelines for determining hybridization parameters are provided in numerous reference, e.g., and Current Protocols in Molecular Biology, ed. Ausubel, *et al.*

The phrase "functional effects" in the context of assays for testing compounds that modulate activity of a prostate cancer protein includes the determination of a parameter that is indirectly or directly under the influence of the prostate cancer protein or nucleic acid, e.g., a functional, physical, or chemical effect, such as the ability to decrease prostate cancer. It includes ligand binding activity; cell growth on soft agar; anchorage dependence; contact inhibition and density limitation of growth; cellular proliferation; cellular transformation; growth factor or serum dependence; tumor specific marker levels; invasiveness into Matrigel; tumor growth and metastasis *in vivo*; mRNA and protein expression in cells undergoing metastasis, and other characteristics of prostate cancer cells. "Functional effects" include *in vitro*, *in vivo*, and *ex vivo* activities.

By "determining the functional effect" is meant assaying for a compound that increases or decreases a parameter that is indirectly or directly under the influence of a prostate cancer protein sequence, e.g., functional, enzymatic, physical and chemical effects. Such functional effects can be measured by any means known to those skilled in the art, e.g., changes in spectroscopic characteristics (e.g., fluorescence, absorbance, refractive index), hydrodynamic (e.g., shape), chromatographic, or solubility properties for the protein, measuring inducible markers or transcriptional activation of the prostate cancer protein; measuring binding activity or binding assays, e.g. binding to antibodies or other ligands, and measuring cellular proliferation. Determination of the functional effect of a compound on prostate cancer can also be performed using prostate cancer assays known to those of skill in the art such as an *in vitro* assays, e.g., cell growth on soft agar; anchorage dependence; contact inhibition and density limitation of growth; cellular proliferation; cellular transformation; growth factor or serum dependence; tumor specific marker levels; invasiveness into Matrigel; tumor growth and metastasis *in vivo*; mRNA and protein

expression in cells undergoing metastasis, and other characteristics of prostate cancer cells. The functional effects can be evaluated by many means known to those skilled in the art, e.g., microscopy for quantitative or qualitative measures of alterations in morphological features, measurement of changes in RNA or protein levels for prostate cancer-associated sequences, measurement of RNA stability, identification of downstream or reporter gene expression (CAT, luciferase, β-gal, GFP and the like), e.g., via chemiluminescence, fluorescence, colorimetric reactions, antibody binding, inducible markers, and ligand binding assays.

"Inhibitors", "activators", and "modulators" of prostate cancer polynucleotide and polypeptide sequences are used to refer to activating, inhibitory, or modulating molecules or compounds identified using *in vitro* and *in vivo* assays of prostate cancer polynucleotide and polypeptide sequences. Inhibitors are compounds that, e.g., bind to, partially or totally block activity, decrease, prevent, delay activation, inactivate, desensitize, or down regulate the activity or expression of prostate cancer proteins, e.g., antagonists. Antisense nucleic acids may seem to inhibit expression and subsequent function of the protein. "Activators" are compounds that increase, open, activate, facilitate, enhance activation, sensitize, agonize, or up regulate prostate cancer protein activity. Inhibitors, activators, or modulators also include genetically modified versions of prostate cancer proteins, e.g., versions with altered activity, as well as naturally occurring and synthetic ligands, antagonists, agonists, antibodies, small chemical molecules and the like. Such assays for inhibitors and activators include, e.g., expressing the prostate cancer protein *in vitro*, in cells, or cell membranes, applying putative modulator compounds, and then determining the functional effects on activity, as described above. Activators and inhibitors of prostate cancer can also be identified by incubating prostate cancer cells with the test compound and determining increases or decreases in the expression of 1 or more prostate cancer proteins, e.g., 1, 2, 3, 4, 5, 10, 15, 20, 25, 30, 40, 50 or more prostate cancer proteins, such as prostate cancer proteins encoded by the sequences set out in Tables 1-16.

Samples or assays comprising prostate cancer proteins that are treated with a potential activator, inhibitor, or modulator are compared to control samples without the inhibitor, activator, or modulator to examine the extent of inhibition. Control samples (untreated with inhibitors) are assigned a relative protein activity value of 100%. Inhibition of a polypeptide is achieved when the activity value relative to the control is about 80%,

preferably 50%, more preferably 25-0%. Activation of a prostate cancer polypeptide is achieved when the activity value relative to the control (untreated with activators) is 110%, more preferably 150%, more preferably 200-500% (i.e., two to five fold higher relative to the control), more preferably 1000-3000% higher.

The phrase "changes in cell growth" refers to any change in cell growth and proliferation characteristics *in vitro* or *in vivo*, such as formation of foci, anchorage independence, semi-solid or soft agar growth, changes in contact inhibition and density limitation of growth, loss of growth factor or serum requirements, changes in cell morphology, gaining or losing immortalization, gaining or losing tumor specific markers, ability to form or suppress tumors when injected into suitable animal hosts, and/or immortalization of the cell. *See, e.g.,* Freshney, *Culture of Animal Cells a Manual of Basic Technique* pp. 231-241 (3rd ed. 1994).

"Tumor cell" refers to precancerous, cancerous, and normal cells in a tumor.

"Cancer cells," "transformed" cells or "transformation" in tissue culture, refers to spontaneous or induced phenotypic changes that do not necessarily involve the uptake of new genetic material. Although transformation can arise from infection with a transforming virus and incorporation of new genomic DNA, or uptake of exogenous DNA, it can also arise spontaneously or following exposure to a carcinogen, thereby mutating an endogenous gene. Transformation is associated with phenotypic changes, such as immortalization of cells, aberrant growth control, nonmorphological changes, and/or malignancy (*see*, Freshney, *Culture of Animal Cells a Manual of Basic Technique* (3rd ed. 1994)).

"Antibody" refers to a polypeptide comprising a framework region from an immunoglobulin gene or fragments thereof that specifically binds and recognizes an antigen. The recognized immunoglobulin genes include the kappa, lambda, alpha, gamma, delta, epsilon, and mu constant region genes, as well as the myriad immunoglobulin variable region genes. Light chains are classified as either kappa or lambda. Heavy chains are classified as gamma, mu, alpha, delta, or epsilon, which in turn define the immunoglobulin classes, IgG, IgM, IgA, IgD and IgE, respectively. Typically, the antigen-binding region of an antibody or its functional equivalent will be most critical in specificity and affinity of binding. See Paul, *Fundamental Immunology.*

An exemplary immunoglobulin (antibody) structural unit comprises a tetramer. Each tetramer is composed of two identical pairs of polypeptide chains, each pair having one "light" (about 25 kD) and one "heavy" chain (about 50-70 kD). The N-terminus of each chain defines a variable region of about 100 to 110 or more amino acids primarily responsible for antigen recognition. The terms variable light chain (V_L) and variable heavy chain (V_H) refer to these light and heavy chains respectively.

Antibodies exist, e.g., as intact immunoglobulins or as a number of well-characterized fragments produced by digestion with various peptidases. Thus, e.g., pepsin digests an antibody below the disulfide linkages in the hinge region to produce $F(ab)'_2$, a dimer of Fab which itself is a light chain joined to V_H-C_H1 by a disulfide bond. The $F(ab)'_2$ may be reduced under mild conditions to break the disulfide linkage in the hinge region, thereby converting the $F(ab)'_2$ dimer into an Fab' monomer. The Fab' monomer is essentially Fab with part of the hinge region (*see Fundamental Immunology* (Paul ed., 3d ed. 1993). While various antibody fragments are defined in terms of the digestion of an intact antibody, one of skill will appreciate that such fragments may be synthesized *de novo* either chemically or by using recombinant DNA methodology. Thus, the term antibody, as used herein, also includes antibody fragments either produced by the modification of whole antibodies, or those synthesized *de novo* using recombinant DNA methodologies (e.g., single chain Fv) or those identified using phage display libraries (*see, e.g.,* McCafferty *et al., Nature* 348:552-554 (1990))

For preparation of antibodies, e.g., recombinant, monoclonal, or polyclonal antibodies, many technique known in the art can be used (*see, e.g.,* Kohler & Milstein, *Nature* 256:495-497 (1975); Kozbor *et al., Immunology Today* 4:72 (1983); Cole *et al.*, pp. 77-96 in *Monoclonal Antibodies and Cancer Therapy* (1985); Coligan, *Current Protocols in Immunology* (1991); Harlow & Lane, *Antibodies, A Laboratory Manual* (1988); and Goding, *Monoclonal Antibodies: Principles and Practice* (2d ed. 1986)). Techniques for the production of single chain antibodies (U.S. Patent 4,946,778) can be adapted to produce antibodies to polypeptides of this invention. Also, transgenic mice, or other organisms such as other mammals, may be used to express humanized antibodies. Alternatively, phage display technology can be used to identify antibodies and heteromeric Fab fragments that

specifically bind to selected antigens (*see, e.g.*, McCafferty *et al.*, *Nature* 348:552-554 (1990); Marks *et al.*, *Biotechnology* 10:779-783 (1992)).

A "chimeric antibody" is an antibody molecule in which (a) the constant region, or a portion thereof, is altered, replaced or exchanged so that the antigen binding site (variable region) is linked to a constant region of a different or altered class, effector function and/or species, or an entirely different molecule which confers new properties to the chimeric antibody, *e.g.*, an enzyme, toxin, hormone, growth factor, drug, etc.; or (b) the variable region, or a portion thereof, is altered, replaced or exchanged with a variable region having a different or altered antigen specificity.

Identification of prostate cancer-associated sequences

In one aspect, the expression levels of genes are determined in different patient samples for which diagnosis information is desired, to provide expression profiles. An expression profile of a particular sample is essentially a "fingerprint" of the state of the sample; while two states may have any particular gene similarly expressed, the evaluation of a number of genes simultaneously allows the generation of a gene expression profile that is characteristic of the state of the cell. That is, normal tissue (e.g., normal prostate or other tissue) may be distinguished from cancerous or metastatic cancerous tissue of the prostate, or prostate cancer tissue or metastatic prostate cancerous tissue can be compared with tissue samples of prostate and other tissues from surviving cancer patients. By comparing expression profiles of tissue in known different prostate cancer states, information regarding which genes are important (including both up- and down-regulation of genes) in each of these states is obtained.

The identification of sequences that are differentially expressed in prostate cancer versus non-prostate cancer tissue allows the use of this information in a number of ways. For example, a particular treatment regime may be evaluated: does a chemotherapeutic drug act to down-regulate prostate cancer, and thus tumor growth or recurrence, in a particular patient. Similarly, diagnosis and treatment outcomes may be done or confirmed by comparing patient samples with the known expression profiles. Metastatic tissue can also be analyzed to determine the stage of prostate cancer in the tissue. Furthermore, these gene expression profiles (or individual genes) allow screening of drug candidates with an eye to

mimicking or altering a particular expression profile; e.g., screening can be done for drugs that suppress the prostate cancer expression profile. This may be done by making biochips comprising sets of the important prostate cancer genes, which can then be used in these screens. These methods can also be done on the protein basis; that is, protein expression levels of the prostate cancer proteins can be evaluated for diagnostic purposes or to screen candidate agents. In addition, the prostate cancer nucleic acid sequences can be administered for gene therapy purposes, including the administration of antisense nucleic acids, or the prostate cancer proteins (including antibodies and other modulators thereof) administered as therapeutic drugs.

Thus the present invention provides nucleic acid and protein sequences that are differentially expressed in prostate cancer, herein termed "prostate cancer sequences." As outlined below, prostate cancer sequences include those that are up-regulated (i.e., expressed at a higher level) in prostate cancer, as well as those that are down-regulated (i.e., expressed at a lower level). In a preferred embodiment, the prostate cancer sequences are from humans; however, as will be appreciated by those in the art, prostate cancer sequences from other organisms may be useful in animal models of disease and drug evaluation; thus, other prostate cancer sequences are provided, from vertebrates, including mammals, including rodents (rats, mice, hamsters, guinea pigs, etc.), primates, farm animals (including sheep, goats, pigs, cows, horses, etc.) and pets, e.g., (dogs, cats, etc.). Prostate cancer sequences from other organisms may be obtained using the techniques outlined below.

Prostate cancer sequences can include both nucleic acid and amino acid sequences. As will be appreciated by those in the art and is more fully outlined below, prostate cancer nucleic acid sequences are useful in a variety of applications, including diagnostic applications, which will detect naturally occurring nucleic acids, as well as screening applications; e.g., biochips comprising nucleic acid probes or PCR microtiter plates with selected probes to the prostate cancer sequences can be generated.

A prostate cancer sequence can be initially identified by substantial nucleic acid and/or amino acid sequence homology to the prostate cancer sequences outlined herein. Such homology can be based upon the overall nucleic acid or amino acid sequence, and is generally determined as outlined below, using either homology programs or hybridization conditions.

For identifying prostate cancer-associated sequences, the prostate cancer screen typically includes comparing genes identified in different tissues, e.g., normal and cancerous tissues, or tumor tissue samples from patients who have metastatic disease vs. non metastatic tissue. Other suitable tissue comparisons include comparing prostate cancer samples with metastatic cancer samples from other cancers, such as lung, breast, gastrointestinal cancers, ovarian, etc. Samples of different stages of prostate cancer, e.g., survivor tissue, drug resistant states, and tissue undergoing metastasis, are applied to biochips comprising nucleic acid probes. The samples are first microdissected, if applicable, and treated as is known in the art for the preparation of mRNA. Suitable biochips are commercially available, e.g. from Affymetrix. Gene expression profiles as described herein are generated and the data analyzed.

In one embodiment, the genes showing changes in expression as between normal and disease states are compared to genes expressed in other normal tissues, preferably normal prostate, but also including, and not limited to lung, heart, brain, liver, breast, kidney, muscle, colon, small intestine, large intestine, spleen, bone and placenta. In a preferred embodiment, those genes identified during the prostate cancer screen that are expressed in any significant amount in other tissues are removed from the profile, although in some embodiments, this is not necessary. That is, when screening for drugs, it is usually preferable that the target be disease specific, to minimize possible side effects.

In a preferred embodiment, prostate cancer sequences are those that are up-regulated in prostate cancer; that is, the expression of these genes is higher in the prostate cancer tissue as compared to non-cancerous tissue. "Up-regulation" as used herein often means at least about a two-fold change, preferably at least about a three fold change, with at least about five-fold or higher being preferred. All unigene cluster identification numbers and accession numbers herein are for the GenBank sequence database and the sequences of the accession numbers are hereby expressly incorporated by reference. GenBank is known in the art, *see, e.g.*, Benson, DA, *et al.*, Nucleic Acids Research 26:1-7 (1998) and http://www.ncbi.nlm.nih.gov/. Sequences are also available in other databases, e.g., European Molecular Biology Laboratory (EMBL) and DNA Database of Japan (DDBJ).

In another preferred embodiment, prostate cancer sequences are those that are down-regulated in prostate cancer; that is, the expression of these genes is lower in prostate

cancer tissue as compared to non-cancerous tissue (*see, e.g.*, Tables 8, 12 and 14). "Down-regulation" as used herein often means at least about a 1.5-fold change more preferrably a two-fold change, preferably at least about a three fold change, with at least about five-fold or higher being most preferred.

Informatics

The ability to identify genes that are over or under expressed in prostate cancer can additionally provide high-resolution, high-sensitivity datasets which can be used in the areas of diagnostics, therapeutics, drug development, pharmacogenetics, protein structure, biosensor development, and other related areas. For example, the expression profiles can be used in diagnostic or prognostic evaluation of patients with prostate cancer. Or as another example, subcellular toxicological information can be generated to better direct drug structure and activity correlation (*see* Anderson, *Pharmaceutical Proteomics: Targets, Mechanism, and Function*, paper presented at the IBC Proteomics conference, Coronado, CA (June 11-12, 1998)). Subcellular toxicological information can also be utilized in a biological sensor device to predict the likely toxicological effect of chemical exposures and likely tolerable exposure thresholds (*see* U.S. Patent No. 5,811,231). Similar advantages accrue from datasets relevant to other biomolecules and bioactive agents (e.g., nucleic acids, saccharides, lipids, drugs, and the like).

Thus, in another embodiment, the present invention provides a database that includes at least one set of assay data. The data contained in the database is acquired, e.g., using array analysis either singly or in a library format. The database can be in substantially any form in which data can be maintained and transmitted, but is preferably an electronic database. The electronic database of the invention can be maintained on any electronic device allowing for the storage of and access to the database, such as a personal computer, but is preferably distributed on a wide area network, such as the World Wide Web.

The focus of the present section on databases that include peptide sequence data is for clarity of illustration only. It will be apparent to those of skill in the art that similar databases can be assembled for any assay data acquired using an assay of the invention.

The compositions and methods for identifying and/or quantitating the relative and/or absolute abundance of a variety of molecular and macromolecular species from a biological sample undergoing prostate cancer, i.e., the identification of prostate cancer-associated sequences described herein, provide an abundance of information, which can be correlated with pathological conditions, predisposition to disease, drug testing, therapeutic monitoring, gene-disease causal linkages, identification of correlates of immunity and physiological status, among others. Although the data generated from the assays of the invention is suited for manual review and analysis, in a preferred embodiment, prior data processing using high-speed computers is utilized.

An array of methods for indexing and retrieving biomolecular information is known in the art. For example, U.S. Patents 6,023,659 and 5,966,712 disclose a relational database system for storing biomolecular sequence information in a manner that allows sequences to be catalogued and searched according to one or more protein function hierarchies. U.S. Patent 5,953,727 discloses a relational database having sequence records containing information in a format that allows a collection of partial-length DNA sequences to be catalogued and searched according to association with one or more sequencing projects for obtaining full-length sequences from the collection of partial length sequences. U.S. Patent 5,706,498 discloses a gene database retrieval system for making a retrieval of a gene sequence similar to a sequence data item in a gene database based on the degree of similarity between a key sequence and a target sequence. U.S. Patent 5,538,897 discloses a method using mass spectroscopy fragmentation patterns of peptides to identify amino acid sequences in computer databases by comparison of predicted mass spectra with experimentally-derived mass spectra using a closeness-of-fit measure. U.S. Patent 5,926,818 discloses a multi-dimensional database comprising a functionality for multi-dimensional data analysis described as on-line analytical processing (OLAP), which entails the consolidation of projected and actual data according to more than one consolidation path or dimension. U.S. Patent 5,295,261 reports a hybrid database structure in which the fields of each database record are divided into two classes, navigational and informational data, with navigational fields stored in a hierarchical topological map which can be viewed as a tree structure or as the merger of two or more such tree structures.

See also Mount *et al., Bioinformatics* (2001); *Biological Sequence Analysis: Probabilistic Models of Proteins and Nucleic Acids* (Durbin *et al.*, eds., 1999); *Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins* (Baxevanis & Oeullette eds., 1998)); Rashidi & Buehler, *Bioinformatics: Basic Applications in Biological Science and Medicine* (1999); *Introduction to Computational Molecular Biology* (Setubal *et al.*, eds 1997); *Bioinformatics: Methods and Protocols* (Misener & Krawetz, eds, 2000); *Bioinformatics: Sequence, Structure, and Databanks: A Practical Approach* (Higgins & Taylor, eds., 2000); Brown, *Bioinformatics: A Biologist's Guide to Biocomputing and the Internet* (2001); Han & Kamber, *Data Mining: Concepts and Techniques* (2000); and Waterman, *Introduction to Computational Biology: Maps, Sequences, and Genomes* (1995).

The present invention provides a computer database comprising a computer and software for storing in computer-retrievable form assay data records cross-tabulated, e.g., with data specifying the source of the target-containing sample from which each sequence specificity record was obtained.

In an exemplary embodiment, at least one of the sources of target-containing sample is from a control tissue sample known to be free of pathological disorders. In a variation, at least one of the sources is a known pathological tissue specimen, e.g., a neoplastic lesion or another tissue specimen to be analyzed for prostate cancer. In another variation, the assay records cross-tabulate one or more of the following parameters for each target species in a sample: (1) a unique identification code, which can include, e.g., a target molecular structure and/or characteristic separation coordinate (e.g., electrophoretic coordinates); (2) sample source; and (3) absolute and/or relative quantity of the target species present in the sample.

The invention also provides for the storage and retrieval of a collection of target data in a computer data storage apparatus, which can include magnetic disks, optical disks, magneto-optical disks, DRAM, SRAM, SGRAM, SDRAM, RDRAM, DDR RAM, magnetic bubble memory devices, and other data storage devices, including CPU registers and on-CPU data storage arrays. Typically, the target data records are stored as a bit pattern in an array of magnetic domains on a magnetizable medium or as an array of charge states or transistor gate states, such as an array of cells in a DRAM device (e.g., each cell comprised of a transistor and a charge storage area, which may be on the transistor). In one embodiment,

the invention provides such storage devices, and computer systems built therewith, comprising a bit pattern encoding a protein expression fingerprint record comprising unique identifiers for at least 10 target data records cross-tabulated with target source.

When the target is a peptide or nucleic acid, the invention preferably provides a method for identifying related peptide or nucleic acid sequences, comprising performing a computerized comparison between a peptide or nucleic acid sequence assay record stored in or retrieved from a computer storage device or database and at least one other sequence. The comparison can include a sequence analysis or comparison algorithm or computer program embodiment thereof (e.g., FASTA, TFASTA, GAP, BESTFIT) and/or the comparison may be of the relative amount of a peptide or nucleic acid sequence in a pool of sequences determined from a polypeptide or nucleic acid sample of a specimen.

The invention also preferably provides a magnetic disk, such as an IBM-compatible (DOS, Windows, Windows95/98/2000, Windows NT, OS/2) or other format (*e.g.*, Linux, SunOS, Solaris, AIX, SCO Unix, VMS, MV, Macintosh, etc.) floppy diskette or hard (fixed, Winchester) disk drive, comprising a bit pattern encoding data from an assay of the invention in a file format suitable for retrieval and processing in a computerized sequence analysis, comparison, or relative quantitation method.

The invention also provides a network, comprising a plurality of computing devices linked via a data link, such as an Ethernet cable (coax or 10BaseT), telephone line, ISDN line, wireless network, optical fiber, or other suitable signal transmission medium, whereby at least one network device (e.g., computer, disk array, etc.) comprises a pattern of magnetic domains (e.g., magnetic disk) and/or charge domains (e.g., an array of DRAM cells) composing a bit pattern encoding data acquired from an assay of the invention.

The invention also provides a method for transmitting assay data that includes generating an electronic signal on an electronic communications device, such as a modem, ISDN terminal adapter, DSL, cable modem, ATM switch, or the like, wherein the signal includes (in native or encrypted format) a bit pattern encoding data from an assay or a database comprising a plurality of assay results obtained by the method of the invention.

In a preferred embodiment, the invention provides a computer system for comparing a query target to a database containing an array of data structures, such as an assay result obtained by the method of the invention, and ranking database targets based on the

degree of identity and gap weight to the target data. A central processor is preferably initialized to load and execute the computer program for alignment and/or comparison of the assay results. Data for a query target is entered into the central processor via an I/O device. Execution of the computer program results in the central processor retrieving the assay data from the data file, which comprises a binary description of an assay result.

The target data or record and the computer program can be transferred to secondary memory, which is typically random access memory (e.g., DRAM, SRAM, SGRAM, or SDRAM). Targets are ranked according to the degree of correspondence between a selected assay characteristic (e.g., binding to a selected affinity moiety) and the same characteristic of the query target and results are output via an I/O device. For example, a central processor can be a conventional computer (e.g., Intel Pentium, PowerPC, Alpha, PA-8000, SPARC, MIPS 4400, MIPS 10000, VAX, etc.); a program can be a commercial or public domain molecular biology software package (e.g., UWGCG Sequence Analysis Software, Darwin); a data file can be an optical or magnetic disk, a data server, a memory device (e.g., DRAM, SRAM, SGRAM, SDRAM, EPROM, bubble memory, flash memory, *etc.*); an I/O device can be a terminal comprising a video display and a keyboard, a modem, an ISDN terminal adapter, an Ethernet port, a punched card reader, a magnetic strip reader, or other suitable I/O device.

The invention also preferably provides the use of a computer system, such as that described above, which comprises: (1) a computer; (2) a stored bit pattern encoding a collection of peptide sequence specificity records obtained by the methods of the invention, which may be stored in the computer; (3) a comparison target, such as a query target; and (4) a program for alignment and comparison, typically with rank-ordering of comparison results on the basis of computed similarity values.

Characteristics of prostate cancer-associated proteins

Prostate cancer proteins of the present invention may be classified as secreted proteins, transmembrane proteins or intracellular proteins. In one embodiment, the prostate cancer protein is an intracellular protein. Intracellular proteins may be found in the cytoplasm and/or in the nucleus. Intracellular proteins are involved in all aspects of cellular function and replication (including, e.g., signaling pathways); aberrant expression of such

proteins often results in unregulated or disregulated cellular processes (*see, e.g.*, *Molecular Biology of the Cell* (Alberts, ed., 3rd ed., 1994). For example, many intracellular proteins have enzymatic activity such as protein kinase activity, protein phosphatase activity, protease activity, nucleotide cyclase activity, polymerase activity and the like. Intracellular proteins also serve as docking proteins that are involved in organizing complexes of proteins, or targeting proteins to various subcellular localizations, and are involved in maintaining the structural integrity of organelles.

An increasingly appreciated concept in characterizing proteins is the presence in the proteins of one or more motifs for which defined functions have been attributed. In addition to the highly conserved sequences found in the enzymatic domain of proteins, highly conserved sequences have been identified in proteins that are involved in protein-protein interaction. For example, Src-homology-2 (SH2) domains bind tyrosine-phosphorylated targets in a sequence dependent manner. PTB domains, which are distinct from SH2 domains, also bind tyrosine phosphorylated targets. SH3 domains bind to proline-rich targets. In addition, PH domains, tetratricopeptide repeats and WD domains to name only a few, have been shown to mediate protein-protein interactions. Some of these may also be involved in binding to phospholipids or other second messengers. As will be appreciated by one of ordinary skill in the art, these motifs can be identified on the basis of primary sequence; thus, an analysis of the sequence of proteins may provide insight into both the enzymatic potential of the molecule and/or molecules with which the protein may associate. One useful database is Pfam (protein families), which is a large collection of multiple sequence alignments and hidden Markov models covering many common protein domains. Versions are available via the internet from Washington University in St. Louis, the Sanger Center in England, and the Karolinska Institute in Sweden (*see, e.g.*, Bateman *et al., Nuc. Acids Res.* 28:263-266 (2000); Sonnhammer *et al., Proteins* 28:405-420 (1997); Bateman *et al., Nuc. Acids Res.* 27:260-262 (1999); and Sonnhammer *et al., Nuc. Acids Res.* 26:320-322- (1998)).

In another embodiment, the prostate cancer sequences are transmembrane proteins. Transmembrane proteins are molecules that span a phospholipid bilayer of a cell. They may have an intracellular domain, an extracellular domain, or both. The intracellular domains of such proteins may have a number of functions including those already described

for intracellular proteins. For example, the intracellular domain may have enzymatic activity and/or may serve as a binding site for additional proteins. Frequently the intracellular domain of transmembrane proteins serves both roles. For example certain receptor tyrosine kinases have both protein kinase activity and SH2 domains. In addition, autophosphorylation of tyrosines on the receptor molecule itself, creates binding sites for additional SH2 domain containing proteins.

Transmembrane proteins may contain from one to many transmembrane domains. For example, receptor tyrosine kinases, certain cytokine receptors, receptor guanylyl cyclases and receptor serine/threonine protein kinases contain a single transmembrane domain. However, various other proteins including channels and adenylyl cyclases contain numerous transmembrane domains. Many important cell surface receptors such as G protein coupled receptors (GPCRs) are classified as "seven transmembrane domain" proteins, as they contain 7 membrane spanning regions. Characteristics of transmembrane domains include approximately 20 consecutive hydrophobic amino acids that may be followed by charged amino acids. Therefore, upon analysis of the amino acid sequence of a particular protein, the localization and number of transmembrane domains within the protein may be predicted (*see, e.g.* PSORT web site http://psort.nibb.ac.jp/). Important transmembrane protein receptors include, but are not limited to the insulin receptor, insulin-like growth factor receptor, human growth hormone receptor, glucose transporters, transferrin receptor, epidermal growth factor receptor, low density lipoprotein receptor, epidermal growth factor receptor, leptin receptor, interleukin receptors, e.g. IL-1 receptor, IL-2 receptor,

The extracellular domains of transmembrane proteins are diverse; however, conserved motifs are found repeatedly among various extracellular domains. Conserved structure and/or functions have been ascribed to different extracellular motifs. Many extracellular domains are involved in binding to other molecules. In one aspect, extracellular domains are found on receptors. Factors that bind the receptor domain include circulating ligands, which may be peptides, proteins, or small molecules such as adenosine and the like. For example, growth factors such as EGF, FGF and PDGF are circulating growth factors that bind to their cognate receptors to initiate a variety of cellular responses. Other factors include cytokines, mitogenic factors, neurotrophic factors and the like. Extracellular domains also

bind to cell-associated molecules. In this respect, they mediate cell-cell interactions. Cell-associated ligands can be tethered to the cell, e.g., via a glycosylphosphatidylinositol (GPI) anchor, or may themselves be transmembrane proteins. Extracellular domains also associate with the extracellular matrix and contribute to the maintenance of the cell structure.

Prostate cancer proteins that are transmembrane are particularly preferred in the present invention as they are readily accessible targets for immunotherapeutics, as are described herein. In addition, as outlined below, transmembrane proteins can be also useful in imaging modalities. Antibodies may be used to label such readily accessible proteins *in situ*. Alternatively, antibodies can also label intracellular proteins, in which case samples are typically permeablized to provide access to intracellular proteins.

It will also be appreciated by those in the art that a transmembrane protein can be made soluble by removing transmembrane sequences, e.g., through recombinant methods. Furthermore, transmembrane proteins that have been made soluble can be made to be secreted through recombinant means by adding an appropriate signal sequence.

In another embodiment, the prostate cancer proteins are secreted proteins; the secretion of which can be either constitutive or regulated. These proteins have a signal peptide or signal sequence that targets the molecule to the secretory pathway. Secreted proteins are involved in numerous physiological events; by virtue of their circulating nature, they serve to transmit signals to various other cell types. The secreted protein may function in an autocrine manner (acting on the cell that secreted the factor), a paracrine manner (acting on cells in close proximity to the cell that secreted the factor) or an endocrine manner (acting on cells at a distance). Thus secreted molecules find use in modulating or altering numerous aspects of physiology. Prostate cancer proteins that are secreted proteins are particularly preferred in the present invention as they serve as good targets for diagnostic markers, *e.g.*, for blood, plasma, serum, or stool tests.

Use of prostate cancer nucleic acids

As described above, prostate cancer sequence is initially identified by substantial nucleic acid and/or amino acid sequence homology or linkage to the prostate cancer sequences outlined herein. Such homology can be based upon the overall nucleic acid or amino acid sequence, and is generally determined as outlined below, using either

homology programs or hybridization conditions. Typically, linked sequences on a mRNA are found on the same molecule.

The prostate cancer nucleic acid sequences of the invention, e.g., the sequences in Tables 1-16, can be fragments of larger genes, i.e., they are nucleic acid segments. "Genes" in this context includes coding regions, non-coding regions, and mixtures of coding and non-coding regions. Accordingly, as will be appreciated by those in the art, using the sequences provided herein, extended sequences, in either direction, of the prostate cancer genes can be obtained, using techniques well known in the art for cloning either longer sequences or the full length sequences; see Ausubel, *et al.*, *supra.* Much can be done by informatics and many sequences can be clustered to include multiple sequences corresponding to a single gene, e.g., systems such as UniGene (see, http://www.ncbi.nlm.nih.gov/UniGene/).

Once the prostate cancer nucleic acid is identified, it can be cloned and, if necessary, its constituent parts recombined to form the entire prostate cancer nucleic acid coding regions or the entire mRNA sequence. Once isolated from its natural source, e.g., contained within a plasmid or other vector or excised therefrom as a linear nucleic acid segment, the recombinant prostate cancer nucleic acid can be further-used as a probe to identify and isolate other prostate cancer nucleic acids, e.g., extended coding regions. It can also be used as a "precursor" nucleic acid to make modified or variant prostate cancer nucleic acids and proteins.

The prostate cancer nucleic acids of the present invention are used in several ways. In a first embodiment, nucleic acid probes to the prostate cancer nucleic acids are made and attached to biochips to be used in screening and diagnostic methods, as outlined below, or for administration, e.g., for gene therapy, vaccine, and/or antisense applications. Alternatively, the prostate cancer nucleic acids that include coding regions of prostate cancer proteins can be put into expression vectors for the expression of prostate cancer proteins, again for screening purposes or for administration to a patient.

In a preferred embodiment, nucleic acid probes to prostate cancer nucleic acids (both the nucleic acid sequences outlined in the figures and/or the complements thereof) are made. The nucleic acid probes attached to the biochip are designed to be substantially complementary to the prostate cancer nucleic acids, *i.e.* the target sequence (either the target

sequence of the sample or to other probe sequences, e.g., in sandwich assays), such that hybridization of the target sequence and the probes of the present invention occurs. As outlined below, this complementarity need not be perfect; there may be any number of base pair mismatches which will interfere with hybridization between the target sequence and the single stranded nucleic acids of the present invention. However, if the number of mutations is so great that no hybridization can occur under even the least stringent of hybridization conditions, the sequence is not a complementary target sequence. Thus, by "substantially complementary" herein is meant that the probes are sufficiently complementary to the target sequences to hybridize under normal reaction conditions, particularly high stringency conditions, as outlined herein.

A nucleic acid probe is generally single stranded but can be partially single and partially double stranded. The strandedness of the probe is dictated by the structure, composition, and properties of the target sequence. In general, the nucleic acid probes range from about 8 to about 100 bases long, with from about 10 to about 80 bases being preferred, and from about 30 to about 50 bases being particularly preferred. That is, generally whole genes are not used. In some embodiments, much longer nucleic acids can be used, up to hundreds of bases.

In a preferred embodiment, more than one probe per sequence is used, with either overlapping probes or probes to different sections of the target being used. That is, two, three, four or more probes, with three being preferred, are used to build in a redundancy for a particular target. The probes can be overlapping (i.e., have some sequence in common), or separate. In some cases, PCR primers may be used to amplify signal for higher sensitivity.

As will be appreciated by those in the art, nucleic acids can be attached or immobilized to a solid support in a wide variety of ways. By "immobilized" and grammatical equivalents herein is meant the association or binding between the nucleic acid probe and the solid support is sufficient to be stable under the conditions of binding, washing, analysis, and removal as outlined below. The binding can typically be covalent or non-covalent. By "non-covalent binding" and grammatical equivalents herein is meant one or more of electrostatic, hydrophilic, and hydrophobic interactions. Included in non-covalent binding is the covalent attachment of a molecule, such as, streptavidin to the support and the non-covalent binding of the biotinylated probe to the streptavidin. By "covalent binding" and grammatical

equivalents herein is meant that the two moieties, the solid support and the probe, are attached by at least one bond, including sigma bonds, pi bonds and coordination bonds. Covalent bonds can be formed directly between the probe and the solid support or can be formed by a cross linker or by inclusion of a specific reactive group on either the solid support or the probe or both molecules. Immobilization may also involve a combination of covalent and non-covalent interactions.

In general, the probes are attached to the biochip in a wide variety of ways, as will be appreciated by those in the art. As described herein, the nucleic acids can either be synthesized first, with subsequent attachment to the biochip, or can be directly synthesized on the biochip.

The biochip comprises a suitable solid substrate. By "substrate" or "solid support" or other grammatical equivalents herein is meant a material that can be modified to contain discrete individual sites appropriate for the attachment or association of the nucleic acid probes and is amenable to at least one detection method. As will be appreciated by those in the art, the number of possible substrates are very large, and include, but are not limited to, glass and modified or functionalized glass, plastics (including acrylics, polystyrene and copolymers of styrene and other materials, polypropylene, polyethylene, polybutylene, polyurethanes, TeflonJ, etc.), polysaccharides, nylon or nitrocellulose, resins, silica or silica-based materials including silicon and modified silicon, carbon, metals, inorganic glasses, plastics, etc. In general, the substrates allow optical detection and do not appreciably fluoresce. A preferred substrate is described in copending application entitled Reusable Low Fluorescent Plastic Biochip, U.S. Application Serial No. 09/270,214, filed March 15, 1999, herein incorporated by reference in its entirety.

Generally the substrate is planar, although as will be appreciated by those in the art, other configurations of substrates may be used as well. For example, the probes may be placed on the inside surface of a tube, for flow-through sample analysis to minimize sample volume. Similarly, the substrate may be flexible, such as a flexible foam, including closed cell foams made of particular plastics.

In a preferred embodiment, the surface of the biochip and the probe may be derivatized with chemical functional groups for subsequent attachment of the two. Thus, e.g., the biochip is derivatized with a chemical functional group including, but not limited to,

amino groups, carboxy groups, oxo groups and thiol groups, with amino groups being particularly preferred. Using these functional groups, the probes can be attached using functional groups on the probes. For example, nucleic acids containing amino groups can be attached to surfaces comprising amino groups, e.g. using linkers as are known in the art; e.g., homo-or hetero-bifunctional linkers as are well known (*see* 1994 Pierce Chemical Company catalog, technical section on cross-linkers, pages 155-200). In addition, in some cases, additional linkers, such as alkyl groups (including substituted and heteroalkyl groups) may be used.

In this embodiment, ôligonucleotides are synthesized as is known in the art, and then attached to the surface of the solid support. As will be appreciated by those skilled in the art, either the 5' or 3' terminus may be attached to the solid support, or attachment may be via an internal nucleoside.

In another embodiment, the immobilization to the solid support may be very strong, yet non-covalent. For example, biotinylated oligonucleotides can be made, which bind to surfaces covalently coated with streptavidin, resulting in attachment.

Alternatively, the oligonucleotides may be synthesized on the surface, as is known in the art. For example, photoactivation techniques utilizing photopolymerization compounds and techniques are used. In a preferred embodiment, the nucleic acids can be synthesized in situ, using well known photolithographic techniques, such as those described in WO 95/25116; WO 95/35505; U.S. Patent Nos. 5,700,637 and 5,445,934; and references cited within, all of which are expressly incorporated by reference; these methods of attachment form the basis of the Affimetrix GeneChip™ technology.

Often, amplification-based assays are performed to measure the expression level of prostate cancer-associated sequences. These assays are typically performed in conjunction with reverse transcription. In such assays, a prostate cancer-associated nucleic acid sequence acts as a template in an amplification reaction (e.g., Polymerase Chain Reaction, or PCR). In a quantitative amplification, the amount of amplification product will be proportional to the amount of template in the original sample. Comparison to appropriate controls provides a measure of the amount of prostate cancer-associated RNA. Methods of quantitative amplification are well known to those of skill in the art. Detailed protocols for

quantitative PCR are provided, e.g., in Innis *et al.*, *PCR Protocols, A Guide to Methods and Applications* (1990).

In some embodiments, a TaqMan based assay is used to measure expression. TaqMan based assays use a fluorogenic oligonucleotide probe that contains a 5' fluorescent dye and a 3' quenching agent. The probe hybridizes to a PCR product, but cannot itself be extended due to a blocking agent at the 3' end. When the PCR product is amplified in subsequent cycles, the 5' nuclease activity of the polymerase, *e.g.*, AmpliTaq, results in the cleavage of the TaqMan probe. This cleavage separates the 5' fluorescent dye and the 3' quenching agent, thereby resulting in an increase in fluorescence as a function of amplification (*see*, e.g., literature provided by Perkin-Elmer, *e.g.*, www2.perkin-elmer.com).

Other suitable amplification methods include, but are not limited to, ligase chain reaction (LCR) (*see* Wu & Wallace, *Genomics* 4:560 (1989), Landegren *et al.*, *Science* 241:1077 (1988), and Barringer *et al.*, *Gene* 89:117 (1990)), transcription amplification (Kwoh *et al.*, *Proc. Natl. Acad. Sci. USA* 86:1173 (1989)), self-sustained sequence replication (Guatelli *et al.*, *Proc. Nat. Acad. Sci. USA* 87:1874 (1990)), dot PCR, and linker adapter PCR, etc.

Expression of prostate cancer proteins from nucleic acids

In a preferred embodiment, prostate cancer nucleic acids, e.g., encoding prostate cancer proteins are used to make a variety of expression vectors to express prostate cancer proteins which can then be used in screening assays, as described below. Expression vectors and recombinant DNA technology are well known to those of skill in the art (*see, e.g.*, Ausubel, *supra*, and *Gene Expression Systems* (Fernandez & Hoeffler, eds, 1999)) and are used to express proteins. The expression vectors may be either self-replicating extrachromosomal vectors or vectors which integrate into a host genome. Generally, these expression vectors include transcriptional and translational regulatory nucleic acid operably linked to the nucleic acid encoding the prostate cancer protein. The term "control sequences" refers to DNA sequences used for the expression of an operably linked coding sequence in a particular host organism. Control sequences that are suitable for prokaryotes, e.g., include a promoter, optionally an operator sequence, and a ribosome binding site. Eukaryotic cells are known to utilize promoters, polyadenylation signals, and enhancers.

Nucleic acid is "operably linked" when it is placed into a functional relationship with another nucleic acid sequence. For example, DNA for a presequence or secretory leader is operably linked to DNA for a polypeptide if it is expressed as a preprotein that participates in the secretion of the polypeptide; a promoter or enhancer is operably linked to a coding sequence if it affects the transcription of the sequence; or a ribosome binding site is operably linked to a coding sequence if it is positioned so as to facilitate translation. Generally, "operably linked" means that the DNA sequences being linked are contiguous, and, in the case of a secretory leader, contiguous and in reading phase. However, enhancers do not have to be contiguous. Linking is typically accomplished by ligation at convenient restriction sites. If such sites do not exist, synthetic oligonucleotide adaptors or linkers are used in accordance with conventional practice. Transcriptional and translational regulatory nucleic acid will generally be appropriate to the host cell used to express the prostate cancer protein. Numerous types of appropriate expression vectors, and suitable regulatory sequences are known in the art for a variety of host cells.

In general, transcriptional and translational regulatory sequences may include, but are not limited to, promoter sequences, ribosomal binding sites, transcriptional start and stop sequences, translational start and stop sequences, and enhancer or activator sequences. In a preferred embodiment, the regulatory sequences include a promoter and transcriptional start and stop sequences.

Promoter sequences encode either constitutive or inducible promoters. The promoters may be either naturally occurring promoters or hybrid promoters. Hybrid promoters, which combine elements of more than one promoter, are also known in the art, and are useful in the present invention.

In addition, an expression vector may comprise additional elements. For example, the expression vector may have two replication systems, thus allowing it to be maintained in two organisms, e.g. in mammalian or insect cells for expression and in a procaryotic host for cloning and amplification. Furthermore, for integrating expression vectors, the expression vector contains at least one sequence homologous to the host cell genome, and preferably two homologous sequences which flank the expression construct. The integrating vector may be directed to a specific locus in the host cell by selecting the

appropriate homologous sequence for inclusion in the vector. Constructs for integrating vectors are well known in the art (e.g., Fernandez & Hoeffler, *supra*).

In addition, in a preferred embodiment, the expression vector contains a selectable marker gene to allow the selection of transformed host cells. Selection genes are well known in the art and will vary with the host cell used.

The prostate cancer proteins of the present invention are produced by culturing a host cell transformed with an expression vector containing nucleic acid encoding a prostate cancer protein, under the appropriate conditions to induce or cause expression of the prostate cancer protein. Conditions appropriate for prostate cancer protein expression will vary with the choice of the expression vector and the host cell, and will be easily ascertained by one skilled in the art through routine experimentation or optimization. For example, the use of constitutive promoters in the expression vector will require optimizing the growth and proliferation of the host cell, while the use of an inducible promoter requires the appropriate growth conditions for induction. In addition, in some embodiments, the timing of the harvest is important. For example, the baculoviral systems used in insect cell expression are lytic viruses, and thus harvest time selection can be crucial for product yield.

Appropriate host cells include yeast, bacteria, archaebacteria, fungi, and insect and animal cells, including mammalian cells. Of particular interest are *Saccharomyces cerevisiae* and other yeasts, *E. coli*, *Bacillus subtilis*, Sf9 cells, C129 cells, 293 cells, *Neurospora*, BHK, CHO, COS, HeLa cells, HUVEC (human umbilical vein endothelial cells), THP1 cells (a macrophage cell line) and various other human cells and cell lines.

In a preferred embodiment, the prostate cancer proteins are expressed in mammalian cells. Mammalian expression systems are also known in the art, and include retroviral and adenoviral systems. One expression vector system is a retroviral vector system such as is generally described in PCT/US97/01019 and PCT/US97/01048, both of which are hereby expressly incorporated by reference. Of particular use as mammalian promoters are the promoters from mammalian viral genes, since the viral genes are often highly expressed and have a broad host range. Examples include the SV40 early promoter, mouse mammary tumor virus LTR promoter, adenovirus major late promoter, herpes simplex virus promoter, and the CMV promoter (*see, e.g.*, Fernandez & Hoeffler, *supra*). Typically, transcription termination and polyadenylation sequences recognized by mammalian cells are regulatory

regions located 3' to the translation stop codon and thus, together with the promoter elements, flank the coding sequence. Examples of transcription terminator and polyadenlyation signals include those derived form SV40.

The methods of introducing exogenous nucleic acid into mammalian hosts, as well as other hosts, is well known in the art, and will vary with the host cell used. Techniques include dextran-mediated transfection, calcium phosphate precipitation, polybrene mediated transfection, protoplast fusion, electroporation, viral infection, encapsulation of the polynucleotide(s) in liposomes, and direct microinjection of the DNA into nuclei.

In a preferred embodiment, prostate cancer proteins are expressed in bacterial systems. Bacterial expression systems are well known in the art. Promoters from bacteriophage may also be used and are known in the art. In addition, synthetic promoters and hybrid promoters are also useful; e.g., the tac promoter is a hybrid of the trp and lac promoter sequences. Furthermore, a bacterial promoter can include naturally occurring promoters of non-bacterial origin that have the ability to bind bacterial RNA polymerase and initiate transcription. In addition to a functioning promoter sequence, an efficient ribosome binding site is desirable. The expression vector may also include a signal peptide sequence that provides for secretion of the prostate cancer protein in bacteria. The protein is either secreted into the growth media (gram-positive bacteria) or into the periplasmic space, located between the inner and outer membrane of the cell (gram-negative bacteria). The bacterial expression vector may also include a selectable marker gene to allow for the selection of bacterial strains that have been transformed. Suitable selection genes include genes which render the bacteria resistant to drugs such as ampicillin, chloramphenicol, erythromycin, kanamycin, neomycin and tetracycline. Selectable markers also include biosynthetic genes, such as those in the histidine, tryptophan and leucine biosynthetic pathways. These components are assembled into expression vectors. Expression vectors for bacteria are well known in the art, and include vectors for *Bacillus subtilis, E. coli, Streptococcus cremoris*, and *Streptococcus lividans*, among others (e.g., Fernandez & Hoeffler, *supra*). The bacterial expression vectors are transformed into bacterial host cells using techniques well known in the art, such as calcium chloride treatment, electroporation, and others.

In one embodiment, prostate cancer proteins are produced in insect cells. Expression vectors for the transformation of insect cells, and in particular, baculovirus-based expression vectors, are well known in the art.

In a preferred embodiment, prostate cancer protein is produced in yeast cells. Yeast expression systems are well known in the art, and include expression vectors for *Saccharomyces cerevisiae, Candida albicans* and *C. maltosa, Hansenula polymorpha, Kluyveromyces fragilis* and *K. lactis, Pichia guillerimondii and P. pastoris, Schizosaccharomyces pombe*, and *Yarrowia lipolytica.*

The prostate cancer protein may also be made as a fusion protein, using techniques well known in the art. Thus, e.g., for the creation of monoclonal antibodies, if the desired epitope is small, the prostate cancer protein may be fused to a carrier protein to form an immunogen. Alternatively, the prostate cancer protein may be made as a fusion protein to increase expression, or for other reasons. For example, when the prostate cancer protein is a prostate cancer peptide, the nucleic acid encoding the peptide may be linked to other nucleic acid for expression purposes.

In a preferred embodiment, the prostate cancer protein is purified or isolated after expression. Prostate cancer proteins may be isolated or purified in a variety of ways known to those skilled in the art depending on what other components are present in the sample. Standard purification methods include electrophoretic, molecular, immunological and chromatographic techniques, including ion exchange, hydrophobic, affinity, and reverse-phase HPLC chromatography, and chromatofocusing. For example, the prostate cancer protein may be purified using a standard anti-prostate cancer protein antibody column. Ultrafiltration and diafiltration techniques, in conjunction with protein concentration, are also useful. For general guidance in suitable purification techniques, see Scopes, *Protein Purification* (1982). The degree of purification necessary will vary depending on the use of the prostate cancer protein. In some instances no purification will be necessary.

Once expressed and purified if necessary, the prostate cancer proteins and nucleic acids are useful in a number of applications. They may be used as immunoselection reagents, as vaccine reagents, as screening agents, etc.

Variants of prostate cancer proteins

In one embodiment, the prostate cancer proteins are derivative or variant prostate cancer proteins as compared to the wild-type sequence. That is, as outlined more fully below, the derivative prostate cancer peptide will often contain at least one amino acid substitution, deletion or insertion, with amino acid substitutions being particularly preferred. The amino acid substitution, insertion or deletion may occur at any residue within the prostate cancer peptide.

Also included within one embodiment of prostate cancer proteins of the present invention are amino acid sequence variants. These variants typically fall into one or more of three classes: substitutional, insertional or deletional variants. These variants ordinarily are prepared by site specific mutagenesis of nucleotides in the DNA encoding the prostate cancer protein, using cassette or PCR mutagenesis or other techniques well known in the art, to produce DNA encoding the variant, and thereafter expressing the DNA in recombinant cell culture as outlined above. However, variant prostate cancer protein fragments having up to about 100-150 residues may be prepared by in vitro synthesis using established techniques. Amino acid sequence variants are characterized by the predetermined nature of the variation, a feature that sets them apart from naturally occurring allelic or interspecies variation of the prostate cancer protein amino acid sequence. The variants typically exhibit the same qualitative biological activity as the naturally occurring analogue, although variants can also be selected which have modified characteristics as will be more fully outlined below.

While the site or region for introducing an amino acid sequence variation is predetermined, the mutation per se need not be predetermined. For example, in order to optimize the performance of a mutation at a given site, random mutagenesis may be conducted at the target codon or region and the expressed prostate cancer variants screened for the optimal combination of desired activity. Techniques for making substitution mutations at predetermined sites in DNA having a known sequence are well known, e.g., M13 primer mutagenesis and PCR mutagenesis. Screening of the mutants is done using assays of prostate cancer protein activities.

Amino acid substitutions are typically of single residues; insertions usually will be on the order of from about 1 to 20 amino acids, although considerably larger

insertions may be tolerated. Deletions range from about 1 to about 20 residues, although in some cases deletions may be much larger.

Substitutions, deletions, insertions or any combination thereof may be used to arrive at a final derivative. Generally these changes are done on a few amino acids to minimize the alteration of the molecule. However, larger changes may be tolerated in certain circumstances. When small alterations in the characteristics of the prostate cancer protein are desired, substitutions are generally made in accordance with the amino acid substitution relationships provided in the definition section.

The variants typically exhibit the same qualitative biological activity and will elicit the same immune response as the naturally-occurring analog, although variants also are selected to modify the characteristics of the prostate cancer proteins as needed. Alternatively, the variant may be designed such that the biological activity of the prostate cancer protein is altered. For example, glycosylation sites may be altered or removed.

Substantial changes in function or immunological identity are made by selecting substitutions that are less conservative than those described above. For example, substitutions may be made which more significantly affect: the structure of the polypeptide backbone in the area of the alteration, for example the alpha-helical or beta-sheet structure; the charge or hydrophobicity of the molecule at the target site; or the bulk of the side chain. The substitutions which in general are expected to produce the greatest changes in the polypeptide's properties are those in which (a) a hydrophilic residue, e.g. seryl or threonyl is substituted for (or by) a hydrophobic residue, e.g. leucyl, isoleucyl, phenylalanyl, valyl or alanyl; (b) a cysteine or proline is substituted for (or by) any other residue; (c) a residue having an electropositive side chain, e.g. lysyl, arginyl, or histidyl, is substituted for (or by) an electronegative residue, e.g. glutamyl or aspartyl; or (d) a residue having a bulky side chain, e.g. phenylalanine, is substituted for (or by) one not having a side chain, e.g. glycine.

Covalent modifications of prostate cancer polypeptides are included within the scope of this invention. One type of covalent modification includes reacting targeted amino acid residues of a prostate cancer polypeptide with an organic derivatizing agent that is capable of reacting with selected side chains or the N-or C-terminal residues of a prostate cancer polypeptide. Derivatization with bifunctional agents is useful, for instance, for crosslinking prostate cancer polypeptides to a water-insoluble support matrix or surface for

use in the method for purifying anti-prostate cancer polypeptide antibodies or screening assays, as is more fully described below. Commonly used crosslinking agents include, e.g., 1,1-bis(diazoacetyl)-2-phenylethane, glutaraldehyde, N-hydroxysuccinimide esters, e.g., esters with 4-azidosalicylic acid, homobifunctional imidoesters, including disuccinimidyl esters such as 3,3'-dithiobis(succinimidylpropionate), bifunctional maleimides such as bis-N-maleimido-1,8-octane and agents such as methyl-3-((p-azidophenyl)dithio)propioimidate.

Other modifications include deamidation of glutaminyl and asparaginyl residues to the corresponding glutamyl and aspartyl residues, respectively, hydroxylation of proline and lysine, phosphorylation of hydroxyl groups of seryl, threonyl or tyrosyl residues, methylation of the amino groups of the lysine, arginine, and histidine side chains (Creighton, *Proteins: Structure and Molecular Properties*, pp. 79-86 (1983)), acetylation of the N-terminal amine, and amidation of any C-terminal carboxyl group.

Another type of covalent modification of the prostate cancer polypeptide included within the scope of this invention comprises altering the native glycosylation pattern of the polypeptide. "Altering the native glycosylation pattern" is intended for purposes herein to mean deleting one or more carbohydrate moieties found in native sequence prostate cancer polypeptide, and/or adding one or more glycosylation sites that are not present in the native sequence prostate cancer polypeptide. Glycosylation patterns can be altered in many ways. For example the use of different cell types to express prostate cancer-associated sequences can result in different glycosylation patterns.

Addition of glycosylation sites to prostate cancer polypeptides may also be accomplished by altering the amino acid sequence thereof. The alteration may be made, e.g., by the addition of, or substitution by, one or more serine or threonine residues to the native sequence prostate cancer polypeptide (for O-linked glycosylation sites). The prostate cancer amino acid sequence may optionally be altered through changes at the DNA level, particularly by mutating the DNA encoding the prostate cancer polypeptide at preselected bases such that codons are generated that will translate into the desired amino acids.

Another means of increasing the number of carbohydrate moieties on the prostate cancer polypeptide is by chemical or enzymatic coupling of glycosides to the polypeptide. Such methods are described in the art, e.g., in WO 87/05330, and in Aplin & Wriston, *CRC Crit. Rev. Biochem.*, pp. 259-306 (1981).

Removal of carbohydrate moieties present on the prostate cancer polypeptide may be accomplished chemically or enzymatically or by mutational substitution of codons encoding for amino acid residues that serve as targets for glycosylation. Chemical deglycosylation techniques are known in the art and described, for instance, by Hakimuddin, *et al.*, *Arch. Biochem. Biophys.*, 259:52 (1987) and by Edge *et al.*, *Anal. Biochem.*, 118:131 (1981). Enzymatic cleavage of carbohydrate moieties on polypeptides can be achieved by the use of a variety of endo-and exo-glycosidases as described by Thotakura *et al.*, *Meth. Enzymol.*, 138:350 (1987).

Another type of covalent modification of prostate cancer comprises linking the prostate cancer polypeptide to one of a variety of nonproteinaceous polymers, e.g., polyethylene glycol, polypropylene glycol, or polyoxyalkylenes, in the manner set forth in U.S. Patent Nos. 4,640,835; 4,496,689; 4,301,144; 4,670,417; 4,791,192 or 4,179,337.

Prostate cancer polypeptides of the present invention may also be modified in a way to form chimeric molecules comprising a prostate cancer polypeptide fused to another, heterologous polypeptide or amino acid sequence. In one embodiment, such a chimeric molecule comprises a fusion of a prostate cancer polypeptide with a tag polypeptide which provides an epitope to which an anti-tag antibody can selectively bind. The epitope tag is generally placed at the amino-or carboxyl-terminus of the prostate cancer polypeptide. The presence of such epitope-tagged forms of a prostate cancer polypeptide can be detected using an antibody against the tag polypeptide. Also, provision of the epitope tag enables the prostate cancer polypeptide to be readily purified by affinity purification using an anti-tag antibody or another type of affinity matrix that binds to the epitope tag. In an alternative embodiment, the chimeric molecule may comprise a fusion of a prostate cancer polypeptide with an immunoglobulin or a particular region of an immunoglobulin. For a bivalent form of the chimeric molecule, such a fusion could be to the Fc region of an IgG molecule.

Various tag polypeptides and their respective antibodies are well known in the art. Examples include poly-histidine (poly-his) or poly-histidine-glycine (poly-his-gly) tags; HIS6 and metal chelation tags, the flu HA tag polypeptide and its antibody 12CA5 (Field *et al.*, *Mol. Cell. Biol.* 8:2159-2165 (1988)); the c-myc tag and the 8F9, 3C7, 6E10, G4, B7 and 9E10 antibodies thereto (Evan *et al.*, *Molecular and Cellular Biology* 5:3610-3616 (1985)); and the Herpes Simplex virus glycoprotein D (gD) tag and its antibody (*Paborsky et al.*,

Protein Engineering 3(6):547-553 (1990)). Other tag polypeptides include the Flag-peptide (*Hopp et al., BioTechnology* 6:1204-1210 (1988)); the KT3 epitope peptide (Martin *et al., Science* 255:192-194 (1992)); tubulin epitope peptide (Skinner *et al., J. Biol. Chem.* 266:15163-15166 (1991)); and the T7 gene 10 protein peptide tag (Lutz-Freyermuth *et al., Proc. Natl. Acad. Sci. USA* 87:6393-6397 (1990)).

Also included are other prostate cancer proteins of the prostate cancer family, and prostate cancer proteins from other organisms, which are cloned and expressed as outlined below. Thus, probe or degenerate polymerase chain reaction (PCR) primer sequences may be used to find other related prostate cancer proteins from humans or other organisms. As will be appreciated by those in the art, particularly useful probe and/or PCR primer sequences include the unique areas of the prostate cancer nucleic acid sequence. As is generally known in the art, preferred PCR primers are from about 15 to about 35 nucleotides in length, with from about 20 to about 30 being preferred, and may contain inosine as needed. The conditions for the PCR reaction are well known in the art (e.g., Innis, PCR Protocols, *supra*).

Antibodies to prostate cancer proteins

In a preferred embodiment, when the prostate cancer protein is to be used to generate antibodies, e.g., for immunotherapy or immunodiagnosis, the prostate cancer protein should share at least one epitope or determinant with the full length protein. By "epitope" or "determinant" herein is typically meant a portion of a protein which will generate and/or bind an antibody or T-cell receptor in the context of MHC. Thus, in most instances, antibodies made to a smaller prostate cancer protein will be able to bind to the full-length protein, particularly linear epitopes. In a preferred embodiment, the epitope is unique; that is, antibodies generated to a unique epitope show little or no cross-reactivity.

Methods of preparing polyclonal antibodies are known to the skilled artisan (e.g., Coligan, *supra*; and Harlow & Lane, *supra*). Polyclonal antibodies can be raised in a mammal, e.g., by one or more injections of an immunizing agent and, if desired, an adjuvant. Typically, the immunizing agent and/or adjuvant will be injected in the mammal by multiple subcutaneous or intraperitoneal injections. The immunizing agent may include a protein encoded by a nucleic acid of the figures or fragment thereof or a fusion protein thereof. It

may be useful to conjugate the immunizing agent to a protein known to be immunogenic in the mammal being immunized. Examples of such immunogenic proteins include but are not limited to keyhole limpet hemocyanin, serum albumin, bovine thyroglobulin, and soybean trypsin inhibitor. Examples of adjuvants which may be employed include Freund's complete adjuvant and MPL-TDM adjuvant (monophosphoryl Lipid A, synthetic trehalose dicorynomycolate). The immunization protocol may be selected by one skilled in the art without undue experimentation.

The antibodies may, alternatively, be monoclonal antibodies. Monoclonal antibodies may be prepared using hybridoma methods, such as those described by Kohler & Milstein, *Nature* 256:495 (1975). In a hybridoma method, a mouse, hamster, or other appropriate host animal, is typically immunized with an immunizing agent to elicit lymphocytes that produce or are capable of producing antibodies that will specifically bind to the immunizing agent. Alternatively, the lymphocytes may be immunized in vitro. The immunizing agent will typically include a polypeptide encoded by a nucleic acid of Tables 1-16 fragment thereof, or a fusion protein thereof. Generally, either peripheral blood lymphocytes ("PBLs") are used if cells of human origin are desired, or spleen cells or lymph node cells are used if non-human mammalian sources are desired. The lymphocytes are then fused with an immortalized cell line using a suitable fusing agent, such as polyethylene glycol, to form a hybridoma cell (Goding, *Monoclonal Antibodies: Principles and Practice*, pp. 59-103 (1986)). Immortalized cell lines are usually transformed mammalian cells, particularly myeloma cells of rodent, bovine and human origin. Usually, rat or mouse myeloma cell lines are employed. The hybridoma cells may be cultured in a suitable culture medium that preferably contains one or more substances that inhibit the growth or survival of the unfused, immortalized cells. For example, if the parental cells lack the enzyme hypoxanthine guanine phosphoribosyl transferase (HGPRT or HPRT), the culture medium for the hybridomas typically will include hypoxanthine, aminopterin, and thymidine ("HAT medium"), which substances prevent the growth of HGPRT-deficient cells.

In one embodiment, the antibodies are bispecific antibodies. Bispecific antibodies are monoclonal, preferably human or humanized, antibodies that have binding specificities for at least two different antigens or that have binding specificities for two epitopes on the same antigen. In one embodiment, one of the binding specificities is for a

protein encoded by a nucleic acid Tables 1-16 or a fragment thereof, the other one is for any other antigen, and preferably for a cell-surface protein or receptor or receptor subunit, preferably one that is tumor specific. Alternatively, tetramer-type technology may create multivalent reagents.

In a preferred embodiment, the antibodies to prostate cancer protein are capable of reducing or eliminating a biological function of a prostate cancer protein, as is described below. That is, the addition of anti-prostate cancer protein antibodies (either polyclonal or preferably monoclonal) to prostate cancer tissue (or cells containing prostate cancer) may reduce or eliminate the prostate cancer. Generally, at least a 25% decrease in activity, growth, size or the like is preferred, with at least about 50% being particularly preferred and about a 95-100% decrease being especially preferred.

In a preferred embodiment the antibodies to the prostate cancer proteins are humanized antibodies (e.g., Xenerex Biosciences, Mederex, Inc., Abgenix, Inc., Protein Design Labs,Inc.) Humanized forms of non-human (e.g., murine) antibodies are chimeric molecules of immunoglobulins, immunoglobulin chains or fragments thereof (such as Fv, Fab, Fab', F(ab')2 or other antigen-binding subsequences of antibodies) which contain minimal sequence derived from non-human immunoglobulin. Humanized antibodies include human immunoglobulins (recipient antibody) in which residues from a complementary determining region (CDR) of the recipient are replaced by residues from a CDR of a non-human species (donor antibody) such as mouse, rat or rabbit having the desired specificity, affinity and capacity. In some instances, Fv framework residues of the human immunoglobulin are replaced by corresponding non-human residues. Humanized antibodies may also comprise residues which are found neither in the recipient antibody nor in the imported CDR or framework sequences. In general, a humanized antibody will comprise substantially all of at least one, and typically two, variable domains, in which all or substantially all of the CDR regions correspond to those of a non-human immunoglobulin and all or substantially all of the framework (FR) regions are those of a human immunoglobulin consensus sequence. The humanized antibody optimally also will comprise at least a portion of an immunoglobulin constant region (Fc), typically that of a human immunoglobulin (Jones *et al.*, *Nature* 321:522-525 (1986); Riechmann *et al.*, *Nature* 332:323-329 (1988); and Presta, *Curr. Op. Struct. Biol.* 2:593-596 (1992)). Humanization

can be essentially performed following the method of Winter and co-workers (Jones *et al.*, *Nature* 321:522-525 (1986); Riechmann *et al.*, *Nature* 332:323-327 (1988); Verhoeyen *et al.*, *Science* 239:1534-1536 (1988)), by substituting rodent CDRs or CDR sequences for the corresponding sequences of a human antibody. Accordingly, such humanized antibodies are chimeric antibodies (U.S. Patent No. 4,816,567), wherein substantially less than an intact human variable domain has been substituted by the corresponding sequence from a non-human species.

Human antibodies can also be produced using various techniques known in the art, including phage display libraries (Hoogenboom & Winter, *J. Mol. Biol.* 227:381 (1991); Marks *et al.*, *J. Mol. Biol.* 222:581 (1991)). The techniques of Cole *et al.* and Boerner *et al.* are also available for the preparation of human monoclonal antibodies (Cole *et al.*, *Monoclonal Antibodies and Cancer Therapy*, p. 77 (1985) and Boerner *et al.*, *J. Immunol.* 147(1):86-95 (1991)). Similarly, human antibodies can be made by introducing of human immunoglobulin loci into transgenic animals, e.g., mice in which the endogenous immunoglobulin genes have been partially or completely inactivated. Upon challenge, human antibody production is observed, which closely resembles that seen in humans in all respects, including gene rearrangement, assembly, and antibody repertoire. This approach is described, e.g., in U.S. Patent Nos. 5,545,807; 5,545,806; 5,569,825; 5,625,126; 5,633,425; 5,661,016, and in the following scientific publications: Marks *et al.*, *Bio/Technology* 10:779-783 (1992); Lonberg *et al.*, *Nature* 368:856-859 (1994); Morrison, *Nature* 368:812-13 (1994); Fishwild *et al.*, *Nature Biotechnology* 14:845-51 (1996); Neuberger, *Nature Biotechnology* 14:826 (1996); Lonberg & Huszar, *Intern. Rev. Immunol.* 13:65-93 (1995).

By immunotherapy is meant treatment of prostate cancer with an antibody raised against prostate cancer proteins. As used herein, immunotherapy can be passive or active. Passive immunotherapy as defined herein is the passive transfer of antibody to a recipient (patient). Active immunization is the induction of antibody and/or T-cell responses in a recipient (patient). Induction of an immune response is the result of providing the recipient with an antigen to which antibodies are raised. As appreciated by one of ordinary skill in the art, the antigen may be provided by injecting a polypeptide against which antibodies are desired to be raised into a recipient, or contacting the recipient with a nucleic

acid capable of expressing the antigen and under conditions for expression of the antigen, leading to an immune response.

In a preferred embodiment the prostate cancer proteins against which antibodies are raised are secreted proteins as described above. Without being bound by theory, antibodies used for treatment, bind and prevent the secreted protein from binding to its receptor, thereby inactivating the secreted prostate cancer protein.

In another preferred embodiment, the prostate cancer protein to which antibodies are raised is a transmembrane protein. Without being bound by theory, antibodies used for treatment, bind the extracellular domain of the prostate cancer protein and prevent it from binding to other proteins, such as circulating ligands or cell-associated molecules. The antibody may cause down-regulation of the transmembrane prostate cancer protein. As will be appreciated by one of ordinary skill in the art, the antibody may be a competitive, non-competitive or uncompetitive inhibitor of protein binding to the extracellular domain of the prostate cancer protein. The antibody is also an antagonist of the prostate cancer protein. Further, the antibody prevents activation of the transmembrane prostate cancer protein. In one aspect, when the antibody prevents the binding of other molecules to the prostate cancer protein, the antibody prevents growth of the cell. The antibody may also be used to target or sensitize the cell to cytotoxic agents, including, but not limited to TNF-α, TNF-β, IL-1, INF-γ and IL-2, or chemotherapeutic agents including 5FU, vinblastine, actinomycin D, cisplatin, methotrexate, and the like. In some instances the antibody belongs to a sub-type that activates serum complement when complexed with the transmembrane protein thereby mediating cytotoxicity or antigen-dependent cytotoxicity (ADCC). Thus, prostate cancer is treated by administering to a patient antibodies directed against the transmembrane prostate cancer protein. Antibody-labeling may activate a co-toxin, localize a toxin payload, or otherwise provide means to locally ablate cells.

In another preferred embodiment, the antibody is conjugated to an effector moiety. The effector moiety can be any number of molecules, including labelling moieties such as radioactive labels or fluorescent labels, or can be a therapeutic moiety. In one aspect the therapeutic moiety is a small molecule that modulates the activity of the prostate cancer protein. In another aspect the therapeutic moiety modulates the activity of molecules associated with or in close proximity to the prostate cancer protein. The therapeutic moiety

may inhibit enzymatic activity such as protease or collagenase or protein kinase activity associated with prostate cancer.

In a preferred embodiment, the therapeutic moiety can also be a cytotoxic agent. In this method, targeting the cytotoxic agent to prostate cancer tissue or cells, results in a reduction in the number of afflicted cells, thereby reducing symptoms associated with prostate cancer. Cytotoxic agents are numerous and varied and include, but are not limited to, cytotoxic drugs or toxins or active fragments of such toxins. Suitable toxins and their corresponding fragments include diphtheria A chain, exotoxin A chain, ricin A chain, abrin A chain, curcin, crotin, phenomycin, enomycin and the like. Cytotoxic agents also include radiochemicals made by conjugating radioisotopes to antibodies raised against prostate cancer proteins, or binding of a radionuclide to a chelating agent that has been covalently attached to the antibody. Targeting the therapeutic moiety to transmembrane prostate cancer proteins not only serves to increase the local concentration of therapeutic moiety in the prostate cancer afflicted area, but also serves to reduce deleterious side effects that may be associated with the therapeutic moiety.

In another preferred embodiment, the prostate cancer protein against which the antibodies are raised is an intracellular protein. In this case, the antibody may be conjugated to a protein which facilitates entry into the cell. In one case, the antibody enters the cell by endocytosis. In another embodiment, a nucleic acid encoding the antibody is administered to the individual or cell. Moreover, wherein the prostate cancer protein can be targeted within a cell, i.e., the nucleus, an antibody thereto contains a signal for that target localization, i.e., a nuclear localization signal.

The prostate cancer antibodies of the invention specifically bind to prostate cancer proteins. By "specifically bind" herein is meant that the antibodies bind to the protein with a K_d of at least about 0.1 mM, more usually at least about 1 μM, preferably at least about 0.1 μM or better, and most preferably, 0.01 μM or better. Selectivity of binding is also important.

Detection of prostate cancer sequence for diagnostic and therapeutic applications

In one aspect, the RNA expression levels of genes are determined for different cellular states in the prostate cancer phenotype. Expression levels of genes in normal tissue

(i.e., not undergoing prostate cancer) and in prostate cancer tissue (and in some cases, for varying severities of prostate cancer that relate to prognosis, as outlined below) are evaluated to provide expression profiles. An expression profile of a particular cell state or point of development is essentially a "fingerprint" of the state. While two states may have any particular gene similarly expressed, the evaluation of a number of genes simultaneously allows the generation of a gene expression profile that is reflective of the state of the cell. By comparing expression profiles of cells in different states, information regarding which genes are important (including both up- and down-regulation of genes) in each of these states is obtained. Then, diagnosis may be performed or confirmed to determine whether a tissue sample has the gene expression profile of normal or cancerous tissue. This will provide for molecular diagnosis of related conditions.

"Differential expression," or grammatical equivalents as used herein, refers to qualitative or quantitative differences in the temporal and/or cellular gene expression patterns within and among cells and tissue. Thus, a differentially expressed gene can qualitatively have its expression altered, including an activation or inactivation, in, e.g., normal versus prostate cancer tissue. Genes may be turned on or turned off in a particular state, relative to another state thus permitting comparison of two or more states. A qualitatively regulated gene will exhibit an expression pattern within a state or cell type which is detectable by standard techniques. Some genes will be expressed in one state or cell type, but not in both. Alternatively, the difference in expression may be quantitative, e.g., in that expression is increased or decreased; i.e., gene expression is either upregulated, resulting in an increased amount of transcript, or downregulated, resulting in a decreased amount of transcript. The degree to which expression differs need only be large enough to quantify via standard characterization techniques as outlined below, such as by use of Affymetrix GeneChip™ expression arrays, Lockhart, *Nature Biotechnology* 14:1675-1680 (1996), hereby expressly incorporated by reference. Other techniques include, but are not limited to, quantitative reverse transcriptase PCR, northern analysis and RNase protection. As outlined above, preferably the change in expression (i.e., upregulation or downregulation) is at least about 50%, more preferably at least about 100%, more preferably at least about 150%, more preferably at least about 200%, with from 300 to at least 1000% being especially preferred.

Evaluation may be at the gene transcript, or the protein level. The amount of gene expression may be monitored using nucleic acid probes to the DNA or RNA equivalent of the gene transcript, and the quantification of gene expression levels, or, alternatively, the final gene product itself (protein) can be monitored, e.g., with antibodies to the prostate cancer protein and standard immunoassays (ELISAs, etc.) or other techniques, including mass spectroscopy assays, 2D gel electrophoresis assays, etc. Proteins corresponding to prostate cancer genes, i.e., those identified as being important in a prostate cancer phenotype, can be evaluated in a prostate cancer diagnostic test.

In a preferred embodiment, gene expression monitoring is performed simultaneously on a number of genes. Multiple protein expression monitoring can be performed as well. Similarly, these assays may be performed on an individual basis as well.

In this embodiment, the prostate cancer nucleic acid probes are attached to biochips as outlined herein for the detection and quantification of prostate cancer sequences in a particular cell. The assays are further described below in the example. PCR techniques can be used to provide greater sensitivity.

In a preferred embodiment nucleic acids encoding the prostate cancer protein are detected. Although DNA or RNA encoding the prostate cancer protein may be detected, of particular interest are methods wherein an mRNA encoding a prostate cancer protein is detected. Probes to detect mRNA can be a nucleotide/deoxynucleotide probe that is complementary to and hybridizes with the mRNA and includes, but is not limited to, oligonucleotides, cDNA or RNA. Probes also should contain a detectable label, as defined herein. In one method the mRNA is detected after immobilizing the nucleic acid to be examined on a solid support such as nylon membranes and hybridizing the probe with the sample. Following washing to remove the non-specifically bound probe, the label is detected. In another method detection of the mRNA is performed in situ. In this method permeabilized cells or tissue samples are contacted with a detectably labeled nucleic acid probe for sufficient time to allow the probe to hybridize with the target mRNA. Following washing to remove the non-specifically bound probe, the label is detected. For example a digoxygenin labeled riboprobe (RNA probe) that is complementary to the mRNA encoding a prostate cancer protein is detected by binding the digoxygenin with an anti-digoxygenin

secondary antibody and developed with nitro blue tetrazolium and 5-bromo-4-chloro-3-indoyl phosphate.

In a preferred embodiment, various proteins from the three classes of proteins as described herein (secreted, transmembrane or intracellular proteins) are used in diagnostic assays. The prostate cancer proteins, antibodies, nucleic acids, modified proteins and cells containing prostate cancer sequences are used in diagnostic assays. This can be performed on an individual gene or corresponding polypeptide level. In a preferred embodiment, the expression profiles are used, preferably in conjunction with high throughput screening techniques to allow monitoring for expression profile genes and/or corresponding polypeptides.

As described and defined herein, prostate cancer proteins, including intracellular, transmembrane or secreted proteins, find use as markers of prostate cancer. Detection of these proteins in putative prostate cancer tissue allows for detection or diagnosis of prostate cancer. In one embodiment, antibodies are used to detect prostate cancer proteins. A preferred method separates proteins from a sample by electrophoresis on a gel (typically a denaturing and reducing protein gel, but may be another type of gel, including isoelectric focusing gels and the like). Following separation of proteins, the prostate cancer protein is detected, e.g., by immunoblotting with antibodies raised against the prostate cancer protein. Methods of immunoblotting are well known to those of ordinary skill in the art.

In another preferred method, antibodies to the prostate cancer protein find use in *in situ* imaging techniques, e.g., in histology (e.g., *Methods in Cell Biology: Antibodies in Cell Biology*, volume 37 (Asai, ed. 1993)). In this method cells are contacted with from one to many antibodies to the prostate cancer protein(s). Following washing to remove non-specific antibody binding, the presence of the antibody or antibodies is detected. In one embodiment the antibody is detected by incubating with a secondary antibody that contains a detectable label. In another method the primary antibody to the prostate cancer protein(s) contains a detectable label, e.g. an enzyme marker that can act on a substrate. In another preferred embodiment each one of multiple primary antibodies contains a distinct and detectable label. This method finds particular use in simultaneous screening for a plurality of prostate cancer proteins. As will be appreciated by one of ordinary skill in the art, many other histological imaging techniques are also provided by the invention.

In a preferred embodiment the label is detected in a fluorometer which has the ability to detect and distinguish emissions of different wavelengths. In addition, a fluorescence activated cell sorter (FACS) can be used in the method.

In another preferred embodiment, antibodies find use in diagnosing prostate cancer from blood, serum, plasma, stool, and other samples. Such samples, therefore, are useful as samples to be probed or tested for the presence of prostate cancer proteins. Antibodies can be used to detect a prostate cancer protein by previously described immunoassay techniques including ELISA, immunoblotting (western blotting), immunoprecipitation, BIACORE technology and the like. Conversely, the presence of antibodies may indicate an immune response against an endogenous prostate cancer protein.

In a preferred embodiment, *in situ* hybridization of labeled prostate cancer nucleic acid probes to tissue arrays is done. For example, arrays of tissue samples, including prostate cancer tissue and/or normal tissue, are made. *In situ* hybridization (*see, e.g.*, Ausubel, *supra*) is then performed. When comparing the fingerprints between an individual and a standard, the skilled artisan can make a diagnosis, a prognosis, or a prediction based on the findings. It is further understood that the genes which indicate the diagnosis may differ from those which indicate the prognosis and molecular profiling of the condition of the cells may lead to distinctions between responsive or refractory conditions or may be predictive of outcomes.

In a preferred embodiment, the prostate cancer proteins, antibodies, nucleic acids, modified proteins and cells containing prostate cancer sequences are used in prognosis assays. As above, gene expression profiles can be generated that correlate to prostate cancer, in terms of long term prognosis. Again, this may be done on either a protein or gene level, with the use of genes being preferred. As above, prostate cancer probes may be attached to biochips for the detection and quantification of prostate cancer sequences in a tissue or patient. The assays proceed as outlined above for diagnosis. PCR method may provide more sensitive and accurate quantification.

Assays for therapeutic compounds

In a preferred embodiment members of the proteins, nucleic acids, and antibodies as described herein are used in drug screening assays. The prostate cancer

proteins, antibodies, nucleic acids, modified proteins and cells containing prostate cancer sequences are used in drug screening assays or by evaluating the effect of drug candidates on a "gene expression profile" or expression profile of polypeptides. In a preferred embodiment, the expression profiles are used, preferably in conjunction with high throughput screening techniques to allow monitoring for expression profile genes after treatment with a candidate agent (e.g., Zlokarnik, *et al.*, *Science* 279:84-8 (1998); Heid, *Genome Res* 6:986-94, 1996).

In a preferred embodiment, the prostate cancer proteins, antibodies, nucleic acids, modified proteins and cells containing the native or modified prostate cancer proteins are used in screening assays. That is, the present invention provides novel methods for screening for compositions which modulate the prostate cancer phenotype or an identified physiological function of a prostate cancer protein. As above, this can be done on an individual gene level or by evaluating the effect of drug candidates on a "gene expression profile". In a preferred embodiment, the expression profiles are used, preferably in conjunction with high throughput screening techniques to allow monitoring for expression profile genes after treatment with a candidate agent, see Zlokarnik, *supra.*

Having identified the differentially expressed genes herein, a variety of assays may be executed. In a preferred embodiment, assays may be run on an individual gene or protein level. That is, having identified a particular gene as up regulated in prostate cancer, test compounds can be screened for the ability to modulate gene expression or for binding to the prostate cancer protein. "Modulation" thus includes both an increase and a decrease in gene expression. The preferred amount of modulation will depend on the original change of the gene expression in normal versus tissue undergoing prostate cancer, with changes of at least 10%, preferably 50%, more preferably 100-300%, and in some embodiments 300-1000% or greater. Thus, if a gene exhibits a 4-fold increase in prostate cancer tissue compared to normal tissue, a decrease of about four-fold is often desired; similarly, a 10-fold decrease in prostate cancer tissue compared to normal tissue often provides a target value of a 10-fold increase in expression to be induced by the test compound.

The amount of gene expression may be monitored using nucleic acid probes and the quantification of gene expression levels, or, alternatively, the gene product itself can be monitored, e.g., through the use of antibodies to the prostate cancer protein and standard

immunoassays. Proteomics and separation techniques may also allow quantification of expression. .

In a preferred embodiment, gene expression or protein monitoring of a number of entities, i.e., an expression profile, is monitored simultaneously. Such profiles will typically involve a plurality of those entities described herein..

In this embodiment, the prostate cancer nucleic acid probes are attached to biochips as outlined herein for the detection and quantification of prostate cancer sequences in a particular cell. Alternatively, PCR may be used. Thus, a series, e.g., of microtiter plate, may be used with dispensed primers in desired wells. A PCR reaction can then be performed and analyzed for each well.

Expression monitoring can be performed to identify compounds that modify the expression of one or more prostate cancer-associated sequences, e.g., a polynucleotide sequence set out in Tables 1-16. Generally, in a preferred embodiment, a test modulator is added to the cells prior to analysis. Moreover, screens are also provided to identify agents that modulate prostate cancer, modulate prostate cancer proteins, bind to a prostate cancer protein, or interfere with the binding of a prostate cancer protein and an antibody or other binding partner.

The term "test compound" or "drug candidate" or "modulator" or grammatical equivalents as used herein describes any molecule, e.g., protein, oligopeptide, small organic molecule, polysaccharide, polynucleotide, etc., to be tested for the capacity to directly or indirectly alter the prostate cancer phenotype or the expression of a prostate cancer sequence, e.g., a nucleic acid or protein sequence. In preferred embodiments, modulators alter expression profiles, or expression profile nucleic acids or proteins provided herein. In one embodiment, the modulator suppresses a prostate cancer phenotype, e.g. to a normal tissue fingerprint. In another embodiment, a modulator induced a prostate cancer phenotype. Generally, a plurality of assay mixtures are run in parallel with different agent concentrations to obtain a differential response to the various concentrations. Typically, one of these concentrations serves as a negative control, i.e., at zero concentration or below the level of detection.

Drug candidates encompass numerous chemical classes, though typically they are organic molecules, preferably small organic compounds having a molecular weight of

more than 100 and less than about 2,500 daltons. Preferred small molecules are less than 2000, or less than 1500 or less than 1000 or less than 500 D. Candidate agents comprise functional groups necessary for structural interaction with proteins, particularly hydrogen bonding, and typically include at least an amine, carbonyl, hydroxyl or carboxyl group, preferably at least two of the functional chemical groups. The candidate agents often comprise cyclical carbon or heterocyclic structures and/or aromatic or polyaromatic structures substituted with one or more of the above functional groups. Candidate agents are also found among biomolecules including peptides, saccharides, fatty acids, steroids, purines, pyrimidines, derivatives, structural analogs or combinations thereof. Particularly preferred are peptides.

In one aspect, a modulator will neutralize the effect of a prostate cancer protein. By "neutralize" is meant that activity of a protein is inhibited or blocked and the consequent effect on the cell.

In certain embodiments, combinatorial libraries of potential modulators will be screened for an ability to bind to a prostate cancer polypeptide or to modulate activity. Conventionally, new chemical entities with useful properties are generated by identifying a chemical compound (called a "lead compound") with some desirable property or activity, e.g., inhibiting activity, creating variants of the lead compound, and evaluating the property and activity of those variant compounds. Often, high throughput screening (HTS) methods are employed for such an analysis.

In one preferred embodiment, high throughput screening methods involve providing a library containing a large number of potential therapeutic compounds (candidate compounds). Such "combinatorial chemical libraries" are then screened in one or more assays to identify those library members (particular chemical species or subclasses) that display a desired characteristic activity. The compounds thus identified can serve as conventional "lead compounds" or can themselves be used as potential or actual therapeutics.

A combinatorial chemical library is a collection of diverse chemical compounds generated by either chemical synthesis or biological synthesis by combining a number of chemical "building blocks" such as reagents. For example, a linear combinatorial chemical library, such as a polypeptide (e.g., mutein) library, is formed by combining a set of chemical building blocks called amino acids in every possible way for a given compound

length (i.e., the number of amino acids in a polypeptide compound). Millions of chemical compounds can be synthesized through such combinatorial mixing of chemical building blocks (Gallop *et al., J. Med. Chem.* 37(9):1233-1251 (1994)).

Preparation and screening of combinatorial chemical libraries is well known to those of skill in the art. Such combinatorial chemical libraries include, but are not limited to, peptide libraries (*see, e.g.,* U.S. Patent No. 5,010,175, Furka, *Pept. Prot. Res.* 37:487-493 (1991), Houghton *et al., Nature,* 354:84-88 (1991)), peptoids (PCT Publication No WO 91/19735), encoded peptides (PCT Publication WO 93/20242), random bio-oligomers (PCT Publication WO 92/00091), benzodiazepines (U.S. Pat. No. 5,288,514), diversomers such as hydantoins, benzodiazepines and dipeptides (Hobbs *et al., Proc. Nat. Acad. Sci. USA* 90:6909-6913 (1993)), vinylogous polypeptides (Hagihara *et al., J. Amer. Chem. Soc.* 114:6568 (1992)), nonpeptidal peptidomimetics with a Beta-D-Glucose scaffolding (Hirschmann *et al., J. Amer. Chem. Soc.* 114:9217-9218 (1992)), analogous organic syntheses of small compound libraries (Chen *et al., J. Amer. Chem.* Soc. 116:2661 (1994)), oligocarbamates (Cho, *et al., Science* 261:1303 (1993)), and/or peptidyl phosphonates (Campbell *et al., J. Org. Chem.* 59:658 (1994)). *See, generally,* Gordon *et al., J. Med. Chem.* 37:1385 (1994), nucleic acid libraries (*see, e.g.,* Strategene, Corp.), peptide nucleic acid libraries (*see, e.g.,* U.S. Patent 5,539,083), antibody libraries (*see, e.g.,* Vaughn *et al., Nature Biotechnology* 14(3):309-314 (1996), and PCT/US96/10287), carbohydrate libraries (*see, e.g.,* Liang *et al., Science* 274:1520-1522 (1996), and U.S. Patent No. 5,593,853), and small organic molecule libraries (*see, e.g.,* benzodiazepines, Baum, C&EN, Jan 18, page 33 (1993); isoprenoids, U.S. Patent No. 5,569,588; thiazolidinones and metathiazanones, U.S. Patent No. 5,549,974; pyrrolidines, U.S. Patent Nos. 5,525,735 and 5,519,134; morpholino compounds, U.S. Patent No. 5,506,337; benzodiazepines, U.S. Patent No. 5,288,514; and the like).

Devices for the preparation of combinatorial libraries are commercially available (*see, e.g.,* 357 MPS, 390 MPS, Advanced Chem Tech, Louisville KY, Symphony, Rainin, Woburn, MA, 433A Applied Biosystems, Foster City, CA, 9050 Plus, Millipore, Bedford, MA).

A number of well known robotic systems have also been developed for solution phase chemistries. These systems include automated workstations like the automated synthesis apparatus developed by Takeda Chemical Industries, LTD. (Osaka,

Japan) and many robotic systems utilizing robotic arms (Zymate II, Zymark Corporation, Hopkinton, Mass.; Orca, Hewlett-Packard, Palo Alto, Calif.), which mimic the manual synthetic operations performed by a chemist. Any of the above devices are suitable for use with the present invention. The nature and implementation of modifications to these devices (if any) so that they can operate as discussed herein will be apparent to persons skilled in the relevant art. In addition, numerous combinatorial libraries are themselves commercially available (*see, e.g.*, ComGenex, Princeton, N.J., Asinex, Moscow, Ru, Tripos, Inc., St. Louis, MO, ChemStar, Ltd, Moscow, RU, 3D Pharmaceuticals, Exton, PA, Martek Biosciences, Columbia, MD, *etc.*).

The assays to identify modulators are amenable to high throughput screening. Preferred assays thus detect enhancement or inhibition of prostate cancer gene transcription, inhibition or enhancement of polypeptide expression, and inhibition or enhancement of polypeptide activity.

High throughput assays for the presence, absence, quantification, or other properties of particular nucleic acids or protein products are well known to those of skill in the art. Similarly, binding assays and reporter gene assays are similarly well known. Thus, e.g., U.S. Patent No. 5,559,410 discloses high throughput screening methods for proteins, U.S. Patent No. 5,585,639 discloses high throughput screening methods for nucleic acid binding (i.e., in arrays), while U.S. Patent Nos. 5,576,220 and 5,541,061 disclose high throughput methods of screening for ligand/antibody binding.

In addition, high throughput screening systems are commercially available (*see, e.g.*, Zymark Corp., Hopkinton, MA; Air Technical Industries, Mentor, OH; Beckman Instruments, Inc. Fullerton, CA; Precision Systems, Inc., Natick, MA, *etc.*). These systems typically automate entire procedures, including all sample and reagent pipetting, liquid dispensing, timed incubations, and final readings of the microplate in detector(s) appropriate for the assay. These configurable systems provide high throughput and rapid start up as well as a high degree of flexibility and customization. The manufacturers of such systems provide detailed protocols for various high throughput systems. Thus, e.g., Zymark Corp. provides technical bulletins describing screening systems for detecting the modulation of gene transcription, ligand binding, and the like.

In one embodiment, modulators are proteins, often naturally occurring proteins or fragments of naturally occurring proteins. Thus, *e.g.*, cellular extracts containing proteins, or random or directed digests of proteinaceous cellular extracts, may be used. In this way libraries of proteins may be made for screening in the methods of the invention. Particularly preferred in this embodiment are libraries of bacterial, fungal, viral, and mammalian proteins, with the latter being preferred, and human proteins being especially preferred. Particularly useful test compound will be directed to the class of proteins to which the target belongs, *e.g.*, substrates for enzymes or ligands and receptors.

In a preferred embodiment, modulators are peptides of from about 5 to about 30 amino acids, with from about 5 to about 20 amino acids being preferred, and from about 7 to about 15 being particularly preferred. The peptides may be digests of naturally occurring proteins as is outlined above, random peptides, or "biased" random peptides. By "randomized" or grammatical equivalents herein is meant that each nucleic acid and peptide consists of essentially random nucleotides and amino acids, respectively. Since generally these random peptides (or nucleic acids, discussed below) are chemically synthesized, they may incorporate any nucleotide or amino acid at any position. The synthetic process can be designed to generate randomized proteins or nucleic acids, to allow the formation of all or most of the possible combinations over the length of the sequence, thus forming a library of randomized candidate bioactive proteinaceous agents.

In one embodiment, the library is fully randomized, with no sequence preferences or constants at any position. In a preferred embodiment, the library is biased. That is, some positions within the sequence are either held constant, or are selected from a limited number of possibilities. For example, in a preferred embodiment, the nucleotides or amino acid residues are randomized within a defined class, e.g., of hydrophobic amino acids, hydrophilic residues, sterically biased (either small or large) residues, towards the creation of nucleic acid binding domains, the creation of cysteines, for cross-linking, prolines for SH-3 domains, serines, threonines, tyrosines or histidines for phosphorylation sites, etc., or to purines, etc.

Modulators of prostate cancer can also be nucleic acids, as defined below. As described above generally for proteins, nucleic acid modulating agents may be naturally occurring nucleic acids, random nucleic acids, or "biased" random nucleic acids. For

example, digests of procaryotic or eucaryotic genomes may be used as is outlined above for proteins.

In certain embodiments, the activity of a prostate cancer-associated protein is down-regulated, or entirely inhibited, by the use of antisense polynucleotide, *i.e.*, a nucleic acid complementary to, and which can preferably hybridize specifically to, a coding mRNA nucleic acid sequence, e.g., a prostate cancer protein mRNA, or a subsequence thereof. Binding of the antisense polynucleotide to the mRNA reduces the translation and/or stability of the mRNA.

In the context of this invention, antisense polynucleotides can comprise naturally-occurring nucleotides, or synthetic species formed from naturally-occurring subunits or their close homologs. Antisense polynucleotides may also have altered sugar moieties or inter-sugar linkages. Exemplary among these are the phosphorothioate and other sulfur containing species which are known for use in the art. Analogs are comprehended by this invention so long as they function effectively to hybridize with the prostate cancer protein mRNA. *See, e.g.,* Isis Pharmaceuticals, Carlsbad, CA; Sequitor, Inc., Natick, MA.

Such antisense polynucleotides can readily be synthesized using recombinant means, or can be synthesized *in vitro*. Equipment for such synthesis is sold by several vendors, including Applied Biosystems. The preparation of other oligonucleotides such as phosphorothioates and alkylated derivatives is also well known to those of skill in the art.

Antisense molecules as used herein include antisense or sense oligonucleotides. Sense oligonucleotides can, e.g., be employed to block transcription by binding to the anti-sense strand. The antisense and sense oligonucleotide comprise a single-stranded nucleic acid sequence (either RNA or DNA) capable of binding to target mRNA (sense) or DNA (antisense) sequences for prostate cancer molecules. Antisense or sense oligonucleotides, according to the present invention, comprise a fragment generally at least about 14 nucleotides, preferably from about 14 to 30 nucleotides. The ability to derive an antisense or a sense oligonucleotide, based upon a cDNA sequence encoding a given protein is described in, e.g., Stein & Cohen (*Cancer Res.* 48:2659 (1988 and van der Krol *et al.* (*BioTechniques* 6:958 (1988)).

In addition to antisense polynucleotides, ribozymes can be used to target and inhibit transcription of prostate cancer-associated nucleotide sequences. A ribozyme is an

RNA molecule that catalytically cleaves other RNA molecules. Different kinds of ribozymes have been described, including group I ribozymes, hammerhead ribozymes, hairpin ribozymes, RNase P, and axhead ribozymes (*see, e.g.*, Castanotto *et al.*, *Adv. in Pharmacology* 25: 289-317 (1994) for a general review of the properties of different ribozymes).

The general features of hairpin ribozymes are described, e.g., in Hampel *et al.*, *Nucl. Acids Res.* 18:299-304 (1990); European Patent Publication No. 0 360 257; U.S. Patent No. 5,254,678. Methods of preparing are well known to those of skill in the art (*see, e.g.*, WO 94/26877; Ojwang *et al.*, *Proc. Natl. Acad. Sci.* USA 90:6340-6344 (1993); Yamada *et al.*, *Human Gene Therapy* 1:39-45 (1994); Leavitt *et al.*, *Proc. Natl. Acad. Sci. USA* 92:699-703 (1995); Leavitt *et al.*, *Human Gene Therapy* 5:1151-120 (1994); and Yamada *et al.*, *Virology* 205: 121-126 (1994)).

Polynucleotide modulators of prostate cancer may be introduced into a cell containing the target nucleotide sequence by formation of a conjugate with a ligand binding molecule, as described in WO 91/04753. Suitable ligand binding molecules include, but are not limited to, cell surface receptors, growth factors, other cytokines, or other ligands that bind to cell surface receptors. Preferably, conjugation of the ligand binding molecule does not substantially interfere with the ability of the ligand binding molecule to bind to its corresponding molecule or receptor, or block entry of the sense or antisense oligonucleotide or its conjugated version into the cell. Alternatively, a polynucleotide modulator of prostate cancer may be introduced into a cell containing the target nucleic acid sequence, e.g., by formation of an polynucleotide-lipid complex, as described in WO 90/10448. It is understood that the use of antisense molecules or knock out and knock in models may also be used in screening assays as discussed above, in addition to methods of treatment.

As noted above, gene expression monitoring is conveniently used to test candidate modultors (*e.g.*, protein, nucleic acid or small molecule). After the candidate agent has been added and the cells allowed to incubate for some period of time, the sample containing a target sequence to be analyzed is added to the biochip. If required, the target sequence is prepared using known techniques. For example, the sample may be treated to lyse the cells, using known lysis buffers, electroporation, etc., with purification and/or amplification such as PCR performed as appropriate. For example, an *in vitro* transcription

with labels covalently attached to the nucleotides is performed. Generally, the nucleic acids are labeled with biotin-FITC or PE, or with cy3 or cy5.

In a preferred embodiment, the target sequence is labeled with, e.g., a fluorescent, a chemiluminescent, a chemical, or a radioactive signal, to provide a means of detecting the target sequence's specific binding to a probe. The label also can be an enzyme, such as, alkaline phosphatase or horseradish peroxidase, which when provided with an appropriate substrate produces a product that can be detected. Alternatively, the label can be a labeled compound or small molecule, such as an enzyme inhibitor, that binds but is not catalyzed or altered by the enzyme. The label also can be a moiety or compound, such as, an epitope tag or biotin which specifically binds to streptavidin. For the example of biotin, the streptavidin is labeled as described above, thereby, providing a detectable signal for the bound target sequence. Unbound labeled streptavidin is typically removed prior to analysis.

As will be appreciated by those in the art, these assays can be direct hybridization assays or can comprise "sandwich assays", which include the use of multiple probes, as is generally outlined in U.S. Patent Nos. 5,681,702, 5,597,909, 5,545,730, 5,594,117, 5,591,584, 5,571,670, 5,580,731, 5,571,670, 5,591,584, 5,624,802, 5,635,352, 5,594,118, 5,359,100, 5,124,246 and 5,681,697, all of which are hereby incorporated by reference. In this embodiment, in general, the target nucleic acid is prepared as outlined above, and then added to the biochip comprising a plurality of nucleic acid probes, under conditions that allow the formation of a hybridization complex.

A variety of hybridization conditions may be used in the present invention, including high, moderate and low stringency conditions as outlined above. The assays are generally run under stringency conditions which allows formation of the label probe hybridization complex only in the presence of target. Stringency can be controlled by altering a step parameter that is a thermodynamic variable, including, but not limited to, temperature, formamide concentration, salt concentration, chaotropic salt concentration pH, organic solvent concentration, etc.

These parameters may also be used to control non-specific binding, as is generally outlined in U.S. Patent No. 5,681,697. Thus it may be desirable to perform certain steps at higher stringency conditions to reduce non-specific binding.

The reactions outlined herein may be accomplished in a variety of ways. Components of the reaction may be added simultaneously, or sequentially, in different orders, with preferred embodiments outlined below. In addition, the reaction may include a variety of other reagents. These include salts, buffers, neutral proteins, e.g. albumin, detergents, *etc.* which may be used to facilitate optimal hybridization and detection, and/or reduce non-specific or background interactions. Reagents that otherwise improve the efficiency of the assay, such as protease inhibitors, nuclease inhibitors, anti-microbial agents, *etc.*, may also be used as appropriate, depending on the sample preparation methods and purity of the target.

The assay data are analyzed to determine the expression levels, and changes in expression levels as between states, of individual genes, forming a gene expression profile.

Screens are performed to identify modulators of the prostate cancer phenotype. In one embodiment, screening is performed to identify modulators that can induce or suppress a particular expression profile, thus preferably generating the associated phenotype. In another embodiment, *e.g.*, for diagnostic applications, having identified differentially expressed genes important in a particular state, screens can be performed to identify modulators that alter expression of individual genes. In an another embodiment, screening is performed to identify modulators that alter a biological function of the expression product of a differentially expressed gene. Again, having identified the importance of a gene in a particular state, screens are performed to identify agents that bind and/or modulate the biological activity of the gene product.

In addition screens can be done for genes that are induced in response to a candidate agent. After identifying a modulator based upon its ability to suppress a prostate cancer expression pattern leading to a normal expression pattern, or to modulate a single prostate cancer gene expression profile so as to mimic the expression of the gene from normal tissue, a screen as described above can be performed to identify genes that are specifically modulated in response to the agent. Comparing expression profiles between normal tissue and agent treated prostate cancer tissue reveals genes that are not expressed in normal tissue or prostate cancer tissue, but are expressed in agent treated tissue. These agent-specific sequences can be identified and used by methods described herein for prostate cancer genes or proteins. In particular these sequences and the proteins they encode find use in marking or identifying agent treated cells. In addition, antibodies can be raised against the

agent induced proteins and used to target novel therapeutics to the treated prostate cancer tissue sample.

Thus, in one embodiment, a test compound is administered to a population of prostate cancer cells, that have an associated prostate cancer expression profile. By "administration" or "contacting" herein is meant that the candidate agent is added to the cells in such a manner as to allow the agent to act upon the cell, whether by uptake and intracellular action, or by action at the cell surface. In some embodiments, nucleic acid encoding a proteinaceous candidate agent (i.e., a peptide) may be put into a viral construct such as an adenoviral or retroviral construct, and added to the cell, such that expression of the peptide agent is accomplished, e.g., PCT US97/01019. Regulatable gene therapy systems can also be used.

Once the test compound has been administered to the cells, the cells can be washed if desired and are allowed to incubate under preferably physiological conditions for some period of time. The cells are then harvested and a new gene expression profile is generated, as outlined herein.

Thus, e.g., prostate cancer tissue may be screened for agents that modulate, e.g., induce or suppress the prostate cancer phenotype. A change in at least one gene, preferably many, of the expression profile indicates that the agent has an effect on prostate cancer activity. By defining such a signature for the prostate cancer phenotype, screens for new drugs that alter the phenotype can be devised. With this approach, the drug target need not be known and need not be represented in the original expression screening platform, nor does the level of transcript for the target protein need to change.

In a preferred embodiment, as outlined above, screens may be done on individual genes and gene products (proteins). That is, having identified a particular differentially expressed gene as important in a particular state, screening of modulators of either the expression of the gene or the gene product itself can be done. The gene products of differentially expressed genes are sometimes referred to herein as "prostate cancer proteins" or a "prostate cancer modulatory protein". The prostate cancer modulatory protein may be a fragment, or alternatively, be the full length protein to the fragment encoded by the nucleic acids of Tables 1-16. Preferably, the prostate cancer modulatory protein is a fragment. In a preferred embodiment, the prostate cancer amino acid sequence which is used to determine

sequence identity or similarity is encoded by a nucleic acid of Tables 1-16. In another embodiment, the sequences are naturally occurring allelic variants of a protein encoded by a nucleic acid of Tables 1-16. In another embodiment, the sequences are sequence variants as further described herein.

Preferably, the prostate cancer modulatory protein is a fragment of approximately 14 to 24 amino acids long. More preferably the fragment is a soluble fragment. Preferably, the fragment includes a non-transmembrane region. In a preferred embodiment, the fragment has an N-terminal Cys to aid in solubility. In one embodiment, the C-terminus of the fragment is kept as a free acid and the N-terminus is a free amine to aid in coupling, i.e., to cysteine.

In one embodiment the prostate cancer proteins are conjugated to an immunogenic agent as discussed herein. In one embodiment the prostate cancer protein is conjugated to BSA.

Measurements of prostate cancer polypeptide activity, or of prostate cancer or the prostate cancer phenotype can be performed using a variety of assays. For example, the effects of the test compounds upon the function of the prostate cancer polypeptides can be measured by examining parameters described above. A suitable physiological change that affects activity can be used to assess the influence of a test compound on the polypeptides of this invention. When the functional consequences are determined using intact cells or animals, one can also measure a variety of effects such as, in the case of prostate cancer associated with tumors, tumor growth, tumor metastasis, neovascularization, hormone release, transcriptional changes to both known and uncharacterized genetic markers (e.g., northern blots), changes in cell metabolism such as cell growth or pH changes, and changes in intracellular second messengers such as cGMP. In the assays of the invention, mammalian prostate cancer polypeptide is typically used, e.g., mouse, preferably human.

Assays to identify compounds with modulating activity can be performed *in vitro*. For example, a prostate cancer polypeptide is first contacted with a potential modulator and incubated for a suitable amount of time, e.g., from 0.5 to 48 hours. In one embodiment, the prostate cancer polypeptide levels are determined *in vitro* by measuring the level of protein or mRNA. The level of protein is measured using immunoassays such as western blotting, ELISA and the like with an antibody that selectively binds to the prostate cancer

polypeptide or a fragment thereof. For measurement of mRNA, amplification, e.g., using PCR, LCR, or hybridization assays, e.g., northern hybridization, RNAse protection, dot blotting, are preferred. The level of protein or mRNA is detected using directly or indirectly labeled detection agents, e.g., fluorescently or radioactively labeled nucleic acids, radioactively or enzymatically labeled antibodies, and the like, as described herein.

Alternatively, a reporter gene system can be devised using the prostate cancer protein promoter operably linked to a reporter gene such as luciferase, green fluorescent protein, CAT, or β-gal. The reporter construct is typically transfected into a cell. After treatment with a potential modulator, the amount of reporter gene transcription, translation, or activity is measured according to standard techniques known to those of skill in the art.

In a preferred embodiment, as outlined above, screens may be done on individual genes and gene products (proteins). That is, having identified a particular differentially expressed gene as important in a particular state, screening of modulators of the expression of the gene or the gene product itself can be done. The gene products of differentially expressed genes are sometimes referred to herein as "prostate cancer proteins." The prostate cancer protein may be a fragment, or alternatively, be the full length protein to a fragment shown herein.

In one embodiment, screening for modulators of expression of specific genes is performed. Typically, the expression of only one or a few genes are evaluated. In another embodiment, screens are designed to first find compounds that bind to differentially expressed proteins. These compounds are then evaluated for the ability to modulate differentially expressed activity. Moreover, once initial candidate compounds are identified, variants can be further screened to better evaluate structure activity relationships.

In a preferred embodiment, binding assays are done. In general, purified or isolated gene product is used; that is, the gene products of one or more differentially expressed nucleic acids are made. For example, antibodies are generated to the protein gene products, and standard immunoassays are run to determine the amount of protein present. Alternatively, cells comprising the prostate cancer proteins can be used in the assays.

Thus, in a preferred embodiment, the methods comprise combining a prostate cancer protein and a candidate compound, and determining the binding of the compound to the prostate cancer protein. Preferred embodiments utilize the human prostate cancer protein,

although other mammalian proteins may also be used, e.g. for the development of animal models of human disease. In some embodiments, as outlined herein, variant or derivative prostate cancer proteins may be used.

Generally, in a preferred embodiment of the methods herein, the prostate cancer protein or the candidate agent is non-diffusably bound to an insoluble support having isolated sample receiving areas (e.g. a microtiter plate, an array, etc.). The insoluble supports may be made of any composition to which the compositions can be bound, is readily separated from soluble material, and is otherwise compatible with the overall method of screening. The surface of such supports may be solid or porous and of any convenient shape. Examples of suitable insoluble supports include microtiter plates, arrays, membranes and beads. These are typically made of glass, plastic (e.g., polystyrene), polysaccharides, nylon or nitrocellulose, teflon™, etc. Microtiter plates and arrays are especially convenient because a large number of assays can be carried out simultaneously, using small amounts of reagents and samples. The particular manner of binding of the composition is not crucial so long as it is compatible with the reagents and overall methods of the invention, maintains the activity of the composition and is nondiffusable. Preferred methods of binding include the use of antibodies (which do not sterically block either the ligand binding site or activation sequence when the protein is bound to the support), direct binding to "sticky" or ionic supports, chemical crosslinking, the synthesis of the protein or agent on the surface, etc. Following binding of the protein or agent, excess unbound material is removed by washing. The sample receiving areas may then be blocked through incubation with bovine serum albumin (BSA), casein or other innocuous protein or other moiety.

In a preferred embodiment, the prostate cancer protein is bound to the support, and a test compound is added to the assay. Alternatively, the candidate agent is bound to the support and the prostate cancer protein is added. Novel binding agents include specific antibodies, non-natural binding agents identified in screens of chemical libraries, peptide analogs, etc. Of particular interest are screening assays for agents that have a low toxicity for human cells. A wide variety of assays may be used for this purpose, including labeled in vitro protein-protein binding assays, electrophoretic mobility shift assays, immunoassays for protein binding, functional assays (phosphorylation assays, etc.) and the like.

The determination of the binding of the test modulating compound to the prostate cancer protein may be done in a number of ways. In a preferred embodiment, the compound is labeled, and binding determined directly, e.g., by attaching all or a portion of the prostate cancer protein to a solid support, adding a labeled candidate agent (e.g., a fluorescent label), washing off excess reagent, and determining whether the label is present on the solid support. Various blocking and washing steps may be utilized as appropriate.

In some embodiments, only one of the components is labeled, e.g., the proteins (or proteinaceous candidate compounds) can be labeled. Alternatively, more than one component can be labeled with different labels, e.g., ^{125}I for the proteins and a fluorophor for the compound. Proximity reagents, e.g., quenching or energy transfer reagents are also useful.

In one embodiment, the binding of the test compound is determined by competitive binding assay. The competitor is a binding moiety known to bind to the target molecule (i.e., a prostate cancer protein), such as an antibody, peptide, binding partner, ligand, etc. Under certain circumstances, there may be competitive binding between the compound and the binding moiety, with the binding moiety displacing the compound. In one embodiment, the test compound is labeled. Either the compound, or the competitor, or both, is added first to the protein for a time sufficient to allow binding, if present. Incubations may be performed at a temperature which facilitates optimal activity, typically between 4 and 40°C. Incubation periods are typically optimized, e.g., to facilitate rapid high throughput screening. Typically between 0.1 and 1 hour will be sufficient. Excess reagent is generally removed or washed away. The second component is then added, and the presence or absence of the labeled component is followed, to indicate binding.

In a preferred embodiment, the competitor is added first, followed by the test compound. Displacement of the competitor is an indication that the test compound is binding to the prostate cancer protein and thus is capable of binding to, and potentially modulating, the activity of the prostate cancer protein. In this embodiment, either component can be labeled. Thus, e.g., if the competitor is labeled, the presence of label in the wash solution indicates displacement by the agent. Alternatively, if the test compound is labeled, the presence of the label on the support indicates displacement.

In an alternative embodiment, the test compound is added first, with incubation and washing, followed by the competitor. The absence of binding by the competitor may indicate that the test compound is bound to the prostate cancer protein with a higher affinity. Thus, if the test compound is labeled, the presence of the label on the support, coupled with a lack of competitor binding, may indicate that the test compound is capable of binding to the prostate cancer protein.

In a preferred embodiment, the methods comprise differential screening to identity agents that are capable of modulating the activity of the prostate cancer proteins. In this embodiment, the methods comprise combining a prostate cancer protein and a competitor in a first sample. A second sample comprises a test compound, a prostate cancer protein, and a competitor. The binding of the competitor is determined for both samples, and a change, or difference in binding between the two samples indicates the presence of an agent capable of binding to the prostate cancer protein and potentially modulating its activity. That is, if the binding of the competitor is different in the second sample relative to the first sample, the agent is capable of binding to the prostate cancer protein.

Alternatively, differential screening is used to identify drug candidates that bind to the native prostate cancer protein, but cannot bind to modified prostate cancer proteins. The structure of the prostate cancer protein may be modeled, and used in rational drug design to synthesize agents that interact with that site. Drug candidates that affect the activity of a prostate cancer protein are also identified by screening drugs for the ability to either enhance or reduce the activity of the protein.

Positive controls and negative controls may be used in the assays. Preferably control and test samples are performed in at least triplicate to obtain statistically significant results. Incubation of all samples is for a time sufficient for the binding of the agent to the protein. Following incubation, samples are washed free of non-specifically bound material and the amount of bound, generally labeled agent determined. For example, where a radiolabel is employed, the samples may be counted in a scintillation counter to determine the amount of bound compound.

A variety of other reagents may be included in the screening assays. These include reagents like salts, neutral proteins, e.g. albumin, detergents, etc. which may be used to facilitate optimal protein-protein binding and/or reduce non-specific or background

interactions. Also reagents that otherwise improve the efficiency of the assay, such as protease inhibitors, nuclease inhibitors, anti-microbial agents, etc., may be used. The mixture of components may be added in an order that provides for the requisite binding.

In a preferred embodiment, the invention provides methods for screening for a compound capable of modulating the activity of a prostate cancer protein. The methods comprise adding a test compound, as defined above, to a cell comprising prostate cancer proteins. Preferred cell types include almost any cell. The cells contain a recombinant nucleic acid that encodes a prostate cancer protein. In a preferred embodiment, a library of candidate agents are tested on a plurality of cells.

In one aspect, the assays are evaluated in the presence or absence or previous or subsequent exposure of physiological signals, e.g. hormones, antibodies, peptides, antigens, cytokines, growth factors, action potentials, pharmacological agents including chemotherapeutics, radiation, carcinogenics, or other cells (i.e. cell-cell contacts). In another example, the determinations are determined at different stages of the cell cycle process.

In this way, compounds that modulate prostate cancer agents are identified. Compounds with pharmacological activity are able to enhance or interfere with the activity of the prostate cancer protein. Once identified, similar structures are evaluated to identify critical structural feature of the compound.

In one embodiment, a method of inhibiting prostate cancer cell division is provided. The method comprises administration of a prostate cancer inhibitor. In another embodiment, a method of inhibiting prostate cancer is provided. The method comprises administration of a prostate cancer inhibitor. In a further embodiment, methods of treating cells or individuals with prostate cancer are provided. The method comprises administration of a prostate cancer inhibitor.

In one embodiment, a prostate cancer inhibitor is an antibody as discussed above. In another embodiment, the prostate cancer inhibitor is an antisense molecule.

A variety of cell growth, proliferation, and metastasis assays are known to those of skill in the art, as described below.

Soft agar growth or colony formation in suspension

Normal cells require a solid substrate to attach and grow. When the cells are transformed, they lose this phenotype and grow detached from the substrate. For example,

transformed cells can grow in stirred suspension culture or suspended in semi-solid media, such as semi-solid or soft agar. The transformed cells, when transfected with tumor suppressor genes, regenerate normal phenotype and require a solid substrate to attach and grow. Soft agar growth or colony formation in suspension assays can be used to identify modulators of prostate cancer sequences, which when expressed in host cells, inhibit abnormal cellular proliferation and transformation. A therapeutic compound would reduce or eliminate the host cells' ability to grow in stirred suspension culture or suspended in semi-solid media, such as semi-solid or soft.

Techniques for soft agar growth or colony formation in suspension assays are described in Freshney, *Culture of Animal Cells a Manual of Basic Technique* (3rd ed., 1994), herein incorporated by reference. *See also*, the methods section of Garkavtsev *et al.* (1996), *supra*, herein incorporated by reference.

Contact inhibition and density limitation of growth

Normal cells typically grow in a flat and organized pattern in a petri dish until they touch other cells. When the cells touch one another, they are contact inhibited and stop growing. When cells are transformed, however, the cells are not contact inhibited and continue to grow to high densities in disorganized foci. Thus, the transformed cells grow to a higher saturation density than normal cells. This can be detected morphologically by the formation of a disoriented monolayer of cells or rounded cells in foci within the regular pattern of normal surrounding cells. Alternatively, labeling index with (^{3}H)-thymidine at saturation density can be used to measure density limitation of growth. *See* Freshney (1994), *supra*. The transformed cells, when transfected with tumor suppressor genes, regenerate a normal phenotype and become contact inhibited and would grow to a lower density.

In this assay, labeling index with (^{3}H)-thymidine at saturation density is a preferred method of measuring density limitation of growth. Transformed host cells are transfected with a prostate cancer-associated sequence and are grown for 24 hours at saturation density in non-limiting medium conditions. The percentage of cells labeling with (^{3}H)-thymidine is determined autoradiographically. *See*, Freshney (1994), *supra*.

Growth factor or serum dependence

Transformed cells have a lower serum dependence than their normal counterparts (*see, e.g.,* Temin, *J. Natl. Cancer Insti.* 37:167-175 (1966); Eagle *et al., J. Exp. Med.* 131:836-879 (1970)); Freshney, *supra.* This is in part due to release of various growth factors by the transformed cells. Growth factor or serum dependence of transformed host cells can be compared with that of control.

Tumor specific markers levels

Tumor cells release an increased amount of certain factors (hereinafter "tumor specific markers") than their normal counterparts. For example, plasminogen activator (PA) is released from human glioma at a higher level than from normal brain cells (*see, e.g.,* Gullino, *Angiogenesis, tumor vascularization, and potential interference with tumor growth.* in *Biological Responses in Cancer*, pp. 178-184 (Mihich (ed.) 1985)). Similarly, Tumor angiogenesis factor (TAF) is released at a higher level in tumor cells than their normal counterparts. *See, e.g.,* Folkman, *Angiogenesis and Cancer, Sem Cancer Biol.* (1992)).

Various techniques which measure the release of these factors are described in Freshney (1994), *supra.* Also, *see,* Unkless *et al.* , *J. Biol. Chem.* 249:4295-4305 (1974); Strickland & Beers, *J. Biol. Chem.* 251:5694-5702 (1976); Whur *et al., Br. J. Cancer* 42:305-312 (1980); Gullino, *Angiogenesis, tumor vascularization, and potential interference with tumor growth.* in *Biological Responses in Cancer*, pp. 178-184 (Mihich (ed.) 1985); Freshney *Anticancer Res.* 5:111-130 (1985).

Invasiveness into Matrigel

The degree of invasiveness into Matrigel or some other extracellular matrix constituent can be used as an assay to identify compounds that modulate prostate cancer-associated sequences. Tumor cells exhibit a good correlation between malignancy and invasiveness of cells into Matrigel or some other extracellular matrix constituent. In this assay, tumorigenic cells are typically used as host cells. Expression of a tumor suppressor gene in these host cells would decrease invasiveness of the host cells.

Techniques described in Freshney (1994), *supra*, can be used. Briefly, the level of invasion of host cells can be measured by using filters coated with Matrigel or some

other extracellular matrix constituent. Penetration into the gel, or through to the distal side of the filter, is rated as invasiveness, and rated histologically by number of cells and distance moved, or by prelabeling the cells with ^{125}I and counting the radioactivity on the distal side of the filter or bottom of the dish. *See, e.g.*, Freshney (1984), *supra.*

Tumor growth in vivo

Effects of prostate cancer-associated sequences on cell growth can be tested in transgenic or immune-suppressed mice. Knock-out transgenic mice can be made, in which the prostate cancer gene is disrupted or in which a prostate cancer gene is inserted. Knock-out transgenic mice can be made by insertion of a marker gene or other heterologous gene into the endogenous prostate cancer gene site in the mouse genome via homologous recombination. Such mice can also be made by substituting the endogenous prostate cancer gene with a mutated version of the prostate cancer gene, or by mutating the endogenous prostate cancer gene, e.g., by exposure to carcinogens.

A DNA construct is introduced into the nuclei of embryonic stem cells. Cells containing the newly engineered genetic lesion are injected into a host mouse embryo, which is re-implanted into a recipient female. Some of these embryos develop into chimeric mice that possess germ cells partially derived from the mutant cell line. Therefore, by breeding the chimeric mice it is possible to obtain a new line of mice containing the introduced genetic lesion (*see, e.g.*, Capecchi *et al.*, *Science* 244:1288 (1989)). Chimeric targeted mice can be derived according to Hogan *et al.*, *Manipulating the Mouse Embryo: A Laboratory Manual*, Cold Spring Harbor Laboratory (1988) and *Teratocarcinomas and Embryonic Stem Cells: A Practical Approach*, Robertson, ed., IRL Press, Washington, D.C., (1987).

Alternatively, various immune-suppressed or immune-deficient host animals can be used. For example, genetically athymic "nude" mouse (*see, e.g.*, Giovanella *et al.*, *J. Natl. Cancer Inst.* 52:921 (1974)), a SCID mouse, a thymectomized mouse, or an irradiated mouse (*see, e.g.*, Bradley *et al.*, *Br. J. Cancer* 38:263 (1978); Selby *et al.*, *Br. J. Cancer* 41:52 (1980)) can be used as a host. Transplantable tumor cells (typically about 10^6 cells) injected into isogenic hosts will produce invasive tumors in a high proportions of cases, while normal cells of similar origin will not. In hosts which developed invasive tumors, cells expressing a prostate cancer-associated sequences are injected subcutaneously. After a

suitable length of time, preferably 4-8 weeks, tumor growth is measured (e.g., by volume or by its two largest dimensions) and compared to the control. Tumors that have statistically significant reduction (using, e.g., Student's T test) are said to have inhibited growth.

Methods of identifying variant prostate cancer-associated sequences

Without being bound by theory, expression of various prostate cancer sequences is correlated with prostate cancer. Accordingly, disorders based on mutant or variant prostate cancer genes may be determined. In one embodiment, the invention provides methods for identifying cells containing variant prostate cancer genes, e.g., determining all or part of the sequence of at least one endogenous prostate cancer genes in a cell. This may be accomplished using any number of sequencing techniques. In a preferred embodiment, the invention provides methods of identifying the prostate cancer genotype of an individual, e.g., determining all or part of the sequence of at least one prostate cancer gene of the individual. This is generally done in at least one tissue of the individual, and may include the evaluation of a number of tissues or different samples of the same tissue. The method may include comparing the sequence of the sequenced prostate cancer gene to a known prostate cancer gene, i.e., a wild-type gene.

The sequence of all or part of the prostate cancer gene can then be compared to the sequence of a known prostate cancer gene to determine if any differences exist. This can be done using any number of known homology programs, such as Bestfit, etc. In a preferred embodiment, the presence of a difference in the sequence between the prostate cancer gene of the patient and the known prostate cancer gene correlates with a disease state or a propensity for a disease state, as outlined herein.

In a preferred embodiment, the prostate cancer genes are used as probes to determine the number of copies of the prostate cancer gene in the genome.

In another preferred embodiment, the prostate cancer genes are used as probes to determine the chromosomal localization of the prostate cancer genes. Information such as chromosomal localization finds use in providing a diagnosis or prognosis in particular when chromosomal abnormalities such as translocations, and the like are identified in the prostate cancer gene locus.

Administration of pharmaceutical and vaccine compositions

In one embodiment, a therapeutically effective dose of a prostate cancer protein or modulator thereof, is administered to a patient. By "therapeutically effective dose" herein is meant a dose that produces effects for which it is administered. The exact dose will depend on the purpose of the treatment, and will be ascertainable by one skilled in the art using known techniques (e.g., Ansel *et al.*, *Pharmaceutical Dosage Forms and Drug Delivery*; Lieberman, *Pharmaceutical Dosage Forms* (vols. 1-3, 1992), Dekker, ISBN 0824770846, 082476918X, 0824712692, 0824716981; Lloyd, *The Art, Science and Technology of Pharmaceutical Compounding* (1999); and Pickar, *Dosage Calculations* (1999)). As is known in the art, adjustments for prostate cancer degradation, systemic versus localized delivery, and rate of new protease synthesis, as well as the age, body weight, general health, sex, diet, time of administration, drug interaction and the severity of the condition may be necessary, and will be ascertainable with routine experimentation by those skilled in the art. U.S. Patent Application N. 09/687,576, further discloses the use of compositions and methods of diagnosis and treatment in prostate cancer is hereby expressly incorporated by reference.

A "patient" for the purposes of the present invention includes both humans and other animals, particularly mammals. Thus the methods are applicable to both human therapy and veterinary applications. In the preferred embodiment the patient is a mammal, preferably a primate, and in the most preferred embodiment the patient is human.

The administration of the prostate cancer proteins and modulators thereof of the present invention can be done in a variety of ways as discussed above, including, but not limited to, orally, subcutaneously, intravenously, intranasally, transdermally, intraperitoneally, intramuscularly, intrapulmonary, vaginally, rectally, or intraocularly. In some instances, e.g., in the treatment of wounds and inflammation, the prostate cancer proteins and modulators may be directly applied as a solution or spray.

The pharmaceutical compositions of the present invention comprise a prostate cancer protein in a form suitable for administration to a patient. In the preferred embodiment, the pharmaceutical compositions are in a water soluble form, such as being present as pharmaceutically acceptable salts, which is meant to include both acid and base addition salts. "Pharmaceutically acceptable acid addition salt" refers to those salts that retain the

biological effectiveness of the free bases and that are not biologically or otherwise undesirable, formed with inorganic acids such as hydrochloric acid, hydrobromic acid, sulfuric acid, nitric acid, phosphoric acid and the like, and organic acids such as acetic acid, propionic acid, glycolic acid, pyruvic acid, oxalic acid, maleic acid, malonic acid, succinic acid, fumaric acid, tartaric acid, citric acid, benzoic acid, cinnamic acid, mandelic acid, methanesulfonic acid, ethanesulfonic acid, p-toluenesulfonic acid, salicylic acid and the like. "Pharmaceutically acceptable base addition salts" include those derived from inorganic bases such as sodium, potassium, lithium, ammonium, calcium, magnesium, iron, zinc, copper, manganese, aluminum salts and the like. Particularly preferred are the ammonium, potassium, sodium, calcium, and magnesium salts. Salts derived from pharmaceutically acceptable organic non-toxic bases include salts of primary, secondary, and tertiary amines, substituted amines including naturally occurring substituted amines, cyclic amines and basic ion exchange resins, such as isopropylamine, trimethylamine, diethylamine, triethylamine, tripropylamine, and ethanolamine.

The pharmaceutical compositions may also include one or more of the following: carrier proteins such as serum albumin; buffers; fillers such as microcrystalline cellulose, lactose, corn and other starches; binding agents; sweeteners and other flavoring agents; coloring agents; and polyethylene glycol.

The pharmaceutical compositions can be administered in a variety of unit dosage forms depending upon the method of administration. For example, unit dosage forms suitable for oral administration include, but are not limited to, powder, tablets, pills, capsules and lozenges. It is recognized that prostate cancer protein modulators (e.g., antibodies, antisense constructs, ribozymes, small organic molecules, *etc.*) when administered orally, should be protected from digestion. This is typically accomplished either by complexing the molecule(s) with a composition to render it resistant to acidic and enzymatic hydrolysis, or by packaging the molecule(s) in an appropriately resistant carrier, such as a liposome or a protection barrier. Means of protecting agents from digestion are well known in the art.

The compositions for administration will commonly comprise a prostate cancer protein modulator dissolved in a pharmaceutically acceptable carrier, preferably an aqueous carrier. A variety of aqueous carriers can be used, e.g., buffered saline and the like. These solutions are sterile and generally free of undesirable matter. These compositions may

be sterilized by conventional, well known sterilization techniques. The compositions may contain pharmaceutically acceptable auxiliary substances as required to approximate physiological conditions such as pH adjusting and buffering agents, toxicity adjusting agents and the like, e.g., sodium acetate, sodium chloride, potassium chloride, calcium chloride, sodium lactate and the like. The concentration of active agent in these formulations can vary widely, and will be selected primarily based on fluid volumes, viscosities, body weight and the like in accordance with the particular mode of administration selected and the patient's needs (e.g., *Remington's Pharmaceutical Science* (15th ed., 1980) and Goodman & Gillman, *The Pharmacologial Basis of Therapeutics* (Hardman *et al.*,eds., 1996)).

Thus, a typical pharmaceutical composition for intravenous administration would be about 0.1 to 10 mg per patient per day. Dosages from 0.1 up to about 100 mg per patient per day may be used, particularly when the drug is administered to a secluded site and not into the blood stream, such as into a body cavity or into a lumen of an organ. Substantially higher dosages are possible in topical administration. Actual methods for preparing parenterally administrable compositions will be known or apparent to those skilled in the art, *e.g.*, *Remington's Pharmaceutical Science* and Goodman and Gillman, *The Pharmacologial Basis of Therapeutics*, *supra.*

The compositions containing modulators of prostate cancer proteins can be administered for therapeutic or prophylactic treatments. In therapeutic applications, compositions are administered to a patient suffering from a disease (e.g., a cancer) in an amount sufficient to cure or at least partially arrest the disease and its complications. An amount adequate to accomplish this is defined as a "therapeutically effective dose." Amounts effective for this use will depend upon the severity of the disease and the general state of the patient's health. Single or multiple administrations of the compositions may be administered depending on the dosage and frequency as required and tolerated by the patient. In any event, the composition should provide a sufficient quantity of the agents of this invention to effectively treat the patient. An amount of modulator that is capable of preventing or slowing the development of cancer in a mammal is referred to as a "prophylactically effective dose." The particular dose required for a prophylactic treatment will depend upon the medical condition and history of the mammal, the particular cancer being prevented, as well as other factors such as age, weight, gender, administration route, efficiency, *etc.* Such prophylactic

treatments may be used, *e.g.*, in a mammal who has previously had cancer to prevent a recurrence of the cancer, or in a mammal who is suspected of having a significant likelihood of developing cancer.

It will be appreciated that the present prostate cancer protein-modulating compounds can be administered alone or in combination with additional prostate cancer modulating compounds or with other therapeutic agent, *e.g.*, other anti-cancer agents or treatments.

In numerous embodiments, one or more nucleic acids, *e.g.*, polynucleotides comprising nucleic acid sequences set forth in Tables 1-16, such as antisense polynucleotides or ribozymes, will be introduced into cells, *in vitro* or *in vivo*. The present invention provides methods, reagents, vectors, and cells useful for expression of prostate cancer-associated polypeptides and nucleic acids using *in vitro* (cell-free), *ex vivo* or *in vivo* (cell or organism-based) recombinant expression systems.

The particular procedure used to introduce the nucleic acids into a host cell for expression of a protein or nucleic acid is application specific. Many procedures for introducing foreign nucleotide sequences into host cells may be used. These include the use of calcium phosphate transfection, spheroplasts, electroporation, liposomes, microinjection, plasma vectors, viral vectors and any of the other well known methods for introducing cloned genomic DNA, cDNA, synthetic DNA or other foreign genetic material into a host cell (*see, e.g.*, Berger & Kimmel, *Guide to Molecular Cloning Techniques, Methods in Enzymology* volume 152 (Berger), Ausubel *et al.*, eds., *Current Protocols* (supplemented through 1999), and Sambrook *et al.*, *Molecular Cloning - A Laboratory Manual* (2nd ed., Vol. 1-3, 1989.

In a preferred embodiment, prostate cancer proteins and modulators are administered as therapeutic agents, and can be formulated as outlined above. Similarly, prostate cancer genes (including both the full-length sequence, partial sequences, or regulatory sequences of the prostate cancer coding regions) can be administered in a gene therapy application. These prostate cancer genes can include antisense applications, either as gene therapy (i.e. for incorporation into the genome) or as antisense compositions, as will be appreciated by those in the art.

Prostate cancer polypeptides and polynucleotides can also be administered as vaccine compositions to stimulate HTL, CTL and antibody responses.. Such vaccine

compositions can include, e.g., lipidated peptides (*see, e.g.*,Vitiello, A. *et al.*, *J. Clin. Invest.* 95:341 (1995)), peptide compositions encapsulated in poly(DL-lactide-co-glycolide) ("PLG") microspheres (*see, e.g.*, Eldridge, *et al.*, *Molec. Immunol.* 28:287-294, (1991); Alonso *et al.*, *Vaccine* 12:299-306 (1994); Jones *et al.*, *Vaccine* 13:675-681 (1995)), peptide compositions contained in immune stimulating complexes (ISCOMS) (*see, e.g.*, Takahashi *et al.*, *Nature* 344:873-875 (1990); Hu *et al.*, *Clin Exp Immunol.* 113:235-243 (1998)), multiple antigen peptide systems (MAPs) (*see, e.g.*, Tam, *Proc. Natl. Acad. Sci. U.S.A.* 85:5409-5413 (1988); Tam, *J. Immunol. Methods* 196:17-32 (1996)), peptides formulated as multivalent peptides; peptides for use in ballistic delivery systems, typically crystallized peptides, viral delivery vectors (Perkus, *et al.*, In: *Concepts in vaccine development* (Kaufmann, ed., p. 379, 1996); Chakrabarti, *et al.*, *Nature* 320:535 (1986); Hu *et al.*, *Nature* 320:537 (1986); Kieny, *et al.*, *AIDS Bio/Technology* 4:790 (1986); Top *et al.*, *J. Infect. Dis.* 124:148 (1971); Chanda *et al.*, *Virology* 175:535 (1990)), particles of viral or synthetic origin (*see, e.g.*, Kofler *et al.*, *J. Immunol. Methods.* 192:25 (1996); Eldridge *et al.*, *Sem. Hematol.* 30:16 (1993); Falo *et al.*, *Nature Med.* 7:649 (1995)), adjuvants (Warren *et al.*, *Annu. Rev. Immunol.* 4:369 (1986); Gupta *et al.*, *Vaccine* 11:293 (1993)), liposomes (Reddy *et al.*, *J. Immunol.* 148:1585 (1992); Rock, *Immunol. Today* 17:131 (1996)), or, naked or particle absorbed cDNA (Ulmer, *et al.*, *Science* 259:1745 (1993); Robinson *et al.*, *Vaccine* 11:957 (1993); Shiver *et al.*, In: *Concepts in vaccine development* (Kaufmann, ed., p. 423, 1996); Cease & Berzofsky, *Annu. Rev. Immunol.* 12:923 (1994) and Eldridge *et al.*, *Sem. Hematol.* 30:16 (1993)). Toxin-targeted delivery technologies, also known as receptor mediated targeting, such as those of Avant Immunotherapeutics, Inc. (Needham, Massachusetts) may also be used.

Vaccine compositions often include adjuvants. Many adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, *Bortadella pertussis* or *Mycobacterium tuberculosis* derived proteins. Certain adjuvants are commercially available as, e.g., Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); AS-2 (SmithKline Beecham, Philadelphia, PA); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides;

polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF, interleukin-2, -7, -12, and other like growth factors, may also be used as adjuvants.

Vaccines can be administered as nucleic acid compositions wherein DNA or RNA encoding one or more of the polypeptides, or a fragment thereof, is administered to a patient. This approach is described, for instance, in Wolff *et. al.*, *Science* 247:1465 (1990) as well as U.S. Patent Nos. 5,580,859; 5,589,466; 5,804,566; 5,739,118; 5,736,524; 5,679,647; WO 98/04720; and in more detail below. Examples of DNA-based delivery technologies include "naked DNA", facilitated (bupivicaine, polymers, peptide-mediated) delivery, cationic lipid complexes, and particle-mediated ("gene gun") or pressure-mediated delivery (*see, e.g.*, U.S. Patent No. 5,922,687).

For therapeutic or prophylactic immunization purposes, the peptides of the invention can be expressed by viral or bacterial vectors. Examples of expression vectors include attenuated viral hosts, such as vaccinia or fowlpox. This approach involves the use of vaccinia virus, e.g., as a vector to express nucleotide sequences that encode prostate cancer polypeptides or polypeptide fragments. Upon introduction into a host, the recombinant vaccinia virus expresses the immunogenic peptide, and thereby elicits an immune response. Vaccinia vectors and methods useful in immunization protocols are described in, *e.g.*, U.S. Patent No. 4,722,848. Another vector is BCG (Bacille Calmette Guerin). BCG vectors are described in Stover *et al.*, *Nature* 351:456-460 (1991). A wide variety of other vectors useful for therapeutic administration or immunization e.g. adeno and adeno-associated virus vectors, retroviral vectors, *Salmonella typhi* vectors, detoxified anthrax toxin vectors, and the like, will be apparent to those skilled in the art from the description herein (*see, e.g.*, Shata *et al.*, *Mol Med Today* 6:66-71 (2000); Shedlock *et al.*, *J Leukoc Biol* 68:793-806 (2000); Hipp *et al.*, *In Vivo* 14:571-85 (2000)).

Methods for the use of genes as DNA vaccines are well known, and include placing a prostate cancer gene or portion of a prostate cancer gene under the control of a regulatable promoter or a tissue-specific promoter for expression in a prostate cancer patient. The prostate cancer gene used for DNA vaccines can encode full-length prostate cancer proteins, but more preferably encodes portions of the prostate cancer proteins including peptides derived from the prostate cancer protein. In one embodiment, a patient is

immunized with a DNA vaccine comprising a plurality of nucleotide sequences derived from a prostate cancer gene. For example, prostate cancer-associated genes or sequence encoding subfragments of a prostate cancer protein are introduced into expression vectors and tested for their immunogenicity in the context of Class I MHC and an ability to generate cytotoxic T cell responses. This procedure provides for production of cytotoxic T cell responses against cells which present antigen, including intracellular epitopes.

In a preferred embodiment, the DNA vaccines include a gene encoding an adjuvant molecule with the DNA vaccine. Such adjuvant molecules include cytokines that increase the immunogenic response to the prostate cancer polypeptide encoded by the DNA vaccine. Additional or alternative adjuvants are available.

In another preferred embodiment prostate cancer genes find use in generating animal models of prostate cancer. When the prostate cancer gene identified is repressed or diminished in cancer tissue, gene therapy technology, e.g., wherein antisense RNA directed to the prostate cancer gene will also diminish or repress expression of the gene. Animal models of prostate cancer find use in screening for modulators of a prostate cancer-associated sequence or modulators of prostate cancer. Similarly, transgenic animal technology including gene knockout technology, e.g. as a result of homologous recombination with an appropriate gene targeting vector, will result in the absence or increased expression of the prostate cancer protein. When desired, tissue-specific expression or knockout of the prostate cancer protein may be necessary.

It is also possible that the prostate cancer protein is overexpressed in prostate cancer. As such, transgenic animals can be generated that overexpress the prostate cancer protein. Depending on the desired expression level, promoters of various strengths can be employed to express the transgene. Also, the number of copies of the integrated transgene can be determined and compared for a determination of the expression level of the transgene. Animals generated by such methods find use as animal models of prostate cancer and are additionally useful in screening for modulators to treat prostate cancer.

Kits for Use in Diagnostic and/or Prognostic Applications

For use in diagnostic, research, and therapeutic applications suggested above, kits are also provided by the invention. In the diagnostic and research applications such kits

may include any or all of the following: assay reagents, buffers, prostate cancer-specific nucleic acids or antibodies, hybridization probes and/or primers, antisense polynucleotides, ribozymes, dominant negative prostate cancer polypeptides or polynucleotides, small molecules inhibitors of prostate cancer-associated sequences *etc.* A therapeutic product may include sterile saline or another pharmaceutically acceptable emulsion and suspension base.

In addition, the kits may include instructional materials containing directions (i.e., protocols) for the practice of the methods of this invention. While the instructional materials typically comprise written or printed materials they are not limited to such. Any medium capable of storing such instructions and communicating them to an end user is contemplated by this invention. Such media include, but are not limited to electronic storage media (e.g., magnetic discs, tapes, cartridges, chips), optical media (e.g., CD ROM), and the like. Such media may include addresses to internet sites that provide such instructional materials.

The present invention also provides for kits for screening for modulators of prostate cancer-associated sequences. Such kits can be prepared from readily available materials and reagents. For example, such kits can comprise one or more of the following materials: a prostate cancer-associated polypeptide or polynucleotide, reaction tubes, and instructions for testing prostate cancer-associated activity. Optionally, the kit contains biologically active prostate cancer protein. A wide variety of kits and components can be prepared according to the present invention, depending upon the intended user of the kit and the particular needs of the user. Diagnosis would typically involve evaluation of a plurality of genes or products. The genes will be selected based on correlations with important parameters in disease which may be identified in historical or outcome data.

EXAMPLES

Example 1: Tissue Preparation, Labeling Chips, and Fingerprints

Purifying total RNA from tissue sample using TRIzol Reagent

The sample weight is first estimated. The tissue samples are homogenized in 1 ml of TRIzol per 50 mg of tissue using a homogenizer (e.g., Polytron 3100). The size of the generator/probe used depends upon the sample amount. A generator that is too large for the amount of tissue to be homogenized will cause a loss of sample and lower RNA yield. A larger generator (e.g., 20 mm) is suitable for tissue samples weighing more than 0.6 g. Fill tubes should not be overfilled. If the working volume is greater than 2 ml and no greater than 10 ml, a 15 ml polypropylene tube (Falcon 2059) is suitable for homogenization.

Tissues should be kept frozen until homogenized. The TRIzol is added directly to the frozen tissue before homogenization. Following homogenization, the insoluble material is removed from the homogenate by centrifugation at 7500 x g for 15 min. in a Sorvall superspeed or 12,000 x g for 10 min. in an Eppendorf centrifuge at 4°C. The cleared homogenate is then transferred to a new tube(s). Samples may be frozen and stored at -60 to -70°C for at least one month or else continue with the purification.

The next process is phase separation. The homogenized samples are incubated for 5 minutes at room temperature. Then, 0.2 ml of chloroform per 1ml of TRIzol reagent is added to the homogenization mixture. The tubes are securely capped and shaken vigorously by hand (do not vortex) for 15 seconds. The samples are then incubated at room temp. for 2-3 minutes and next centrifuged at 6500 rpm in a Sorvall superspeed for 30 min. at 4oC.

The next process is RNA Precipitation. The aqueous phase is transferred to a fresh tube. The organic phase can be saved if isolation of DNA or protein is desired. Then 0.5 ml of isopropyl alcohol is added per 1ml of TRIzol reagent used in the original homogenization. Then, the tubes are securely capped and inverted to mix. The samples are then incubated at room temp. for 10 minutes an centrifuged at 6500 rpm in Sorvall for 20 min. at 4°C.

The RNA is then washed. The supernatant is poured off and the pellet washed with cold 75% ethanol. 1 ml of 75% ethanol is used per 1 ml of the TRIzol reagent used in the initial homogenization. The tubes are capped securely and inverted several times to loosen pellet without vortexing . They are next centrifuged at <8000 rpm (<7500 x g) for 5 minutes at 4°C.

The RNA wash is decanted. The pellet is carefully transferred to an Eppendorf tube (sliding down the tube into the new tube by use of a pipet tip to help guide it in if necessary). Tube(s) sizes for precipitating the RNA depending on the working volumes. Larger tubes may take too long to dry. Dry pellet. The RNA is then resuspended in an appropriate volume (e.g., 2 -5 ug/ul) of DEPC H_20. The absorbance is then measured.

The poly A+ mRNA may next be purified from total RNA by other methods such as Qiagen' s RNeasy kit. The poly A $^+$ mRNA is purified from total RNA by adding the oligotex suspension which has been heated to 37°C and mixing prior to adding to RNA. The Elution Buffer is incubated at 70°C. If there is precipitate in the buffer, warm up the 2 x Binding Buffer at 65°C. The the total RNA is mixed with DEPC-treated water, 2 x Binding Buffer, and Oligotex according to Table 2 on page 16 of the Oligotex Handbook and next incubated for 3 minutes at 65°C and 10 minutes at room temperature.

The preparation is centrifuged for 2 minutes at 14,000 to 18,000 g, preferably, at a "soft setting," The supernatant is removed without disturbing Oligotex pellet. A little bit of solution can be left behind to reduce the loss of Oligotex. The supernatant is saved until satisfactory binding and elution of poly A^+ mRNA has been found.

Then, the preparation is gently resuspended in Wash Buffer OW2 and pipetted onto the spin column and centrifuged at full speed (soft setting if possible) for 1 minute.

Next, the spin column is transferred to a new collection tube and gently resuspended in Wash Buffer OW2 and centrifuged as described herein.

Then, the spin column is transferred to a new tube and eluted with 20 to 100 ul of preheated (70°C) Elution Buffer. The Oligotex resin is gently resuspended by pipetting up and down. The centrifugation is repeated as above and the elution repeated with fresh elution buffer or first eluate to keep the elution volume low.

The absorbance is next read to determine the yield, using diluted Elution Buffer as the blank.

Before proceeding with cDNA synthesis, the mRNA is precipitated before proceeding with cDNA synthesis, as components leftover or in the Elution Buffer from the Oligotex purification procedure will inhibit downstream enzymatic reactions of the mRNA. 0.4 vol. of 7.5 M NH4OAc + 2.5 vol. of cold 100% ethanol is added and the preparation precipitated at -20°C 1 hour to overnight (or 20-30 min. at -70°C), and centrifuged at 14,000-16,000 x g for 30 minutes at 4°C. Next, the pellet is washed with 0.5 ml of 80% ethanol (-20°C) and then centrifuged at 14,000-16,000 x g for 5 minutes at room temperature. The80% ethanol wash is then repeated. The last bit of ethanol from the pellet is then dried without use of a speed vacuum and the pellet is then resuspended in DEPC H_20 at 1ug/ul concentration.

Alternatively the RNA may be purified using other methods (e.g., Qiagen's RNeasy kit).

No more than 100 ug is added to the RNeasy column. The sample volume is adjusted to 100 ul with RNase-free water. 350 ul Buffer RLT and then 250 ul ethanol (100%) are added to the sample. The preparation is then mixed by pipetting and applied to an RNeasy mini spin column for centrifugation (15 sec at >10,000 rpm). If yield is low, reapply the flowthrough to the column and centrifuge again.

Then, transfer column to a new 2 ml collection tube and add 500 ul Buffer RPE and centrifuge for 15 sec at >10,000 rpm. The flowthrough is discarded. 500 ul Buffer RPE and is then added and the preparation is centriuged for 15 sec at >10,000 rpm. The flowthrough is discarded. and the column membrane dried by centrifuging for 2 min at maximum speed. The column is transferred to a new 1.5-ml collection tube. 30-50 ul of RNase-free water is applied directly onto column membrane. The column is then centrifuged for 1 min at >10,000 rpm and the elution step repeated.

The absorbance is then read to determine yield. If necessary, the material may be ethanol precipitated with ammonium acetate and 2.5X volume 100% ethanol.

First Strand cDNA Synthesis

The first strand can be make using using Gibco's "SuperScript Choice System for cDNA Synthesis" kit. The starting material is 5 ug of total RNA or 1 ug of polyA+ mRNAl. For total RNA, 2 ul of SuperScript RT is used; for polyA+ mRNA, 1 ul of SuperScript RT is used. The final volume of first strand synthesis mix is 20 ul. The RNA should be in a volume no greater than 10 ul. The RNA is incubated with 1 ul of 100 pmol T7-T24 oligo for 10 min at 70°C followed by addition on ice of 7 ul of: 4ul 5X 1st Strand Buffer, 2 ul of 0.1M DTT, and 1 ul of 10mM dNTP mix. The preparation is then incubated at 37°C for 2 min before addition of the SuperScript RT followed by incubation at 37°C for 1 hour.

Second Strand Synthesis

For the second strand synthesis, place 1st strand reactions on ice and add: 91 ul DEPC H_20; 30 ul 5X 2nd Strand Buffer; 3 ul 10mM dNTP mix; 1 ul 10 U/ul E.coli DNA Ligase; 4 ul 10 U/ul E.coli DNA Polymerase; and 1 ul 2 U/ul RNase H. Mix and incubate 2 hours at 16°C. Add 2 ul T4 DNA Polymerase. Incubate 5 min at 16°C. Add 10 ul of 0.5M EDTA.

Cleaning up cDNA

The cDNA is purified using Phenol:Chloroform:Isoamyl Alcohol (25:24:1) and Phase-Lock gel tubes. The PLG tubes are centrifuged for 30 sec at maximum speed. The cDNA mix is then transferred to PLG tube. An equal volume of phenol:chloroform:isamyl alcohol is then added, the preparation shaken vigorously (no vortexing), and centrifuged for 5 minutes at maximum speed. The top aqueous solution is transferred to a new tube and ethanol precipitated by adding 7.5X 5M NH4OAc and 2.5X volume of 100% ethanol. Next, it is centrifuged immediately at room temperature for 20 min, maximum speed. The supernatant is removed, and the pellet washed with 2X with cold 80% ethanol. As much ethanol wash as possible should be removed before air drying the pellet; and resuspending it in 3 ul RNase-free water.

In vitro Transcription (IVT) and labeling with biotin

In vitro Transcription (IVT) and labeling with biotin is performed as follows: Pipet 1.5 ul of cDNA into a thin-wall PCR tube. Make NTP labeling mix by combining 2 ul T7 10xATP (75 mM) (Ambion); 2 ul T7 10xGTP (75 mM) (Ambion); 1.5 ul T7 10xCTP (75 mM) (Ambion); 1.5 ul T7 10xUTP (75 mM) (Ambion); 3.75 ul 10 mM Bio-11-UTP (Boehringer-Mannheim/Roche or Enzo); 3.75 ul 10 mM Bio-16-CTP (Enzo); 2 ul 10x T7 transcription buffer (Ambion); and 2 ul 10x T7 enzyme mix (Ambion). The final volume is 20 ul. Incubate 6 hours at 37°C in a PCR machine. The RNA can be furthered cleaned. Clean-up follows the previous instructions for RNeasy columns or Qiagen's RNeasy protocol handbook. The cRNA often needs to be ethanol precipitated by resuspension in a volume compatible with the fragmentation step.

Fragmentation is performed as follows. 15 ug of labeled RNA is usually fragmented. Try to minimize the fragmentation reaction volume; a 10 ul volume is recommended but 20 ul is all right. Do not go higher than 20 ul because the magnesium in the fragmentation buffer contributes to precipitation in the hybridization buffer. Fragment RNA by incubation at 94 C for 35 minutes in 1 x Fragmentation buffer (5 x Fragmentation buffer is 200 mM Tris-acetate, pH 8.1; 500 mM KOAc; 150 mM MgOAc). The labeled RNA transcript can be analyzed before and after fragmentation. Samples can be heated to 65°C for 15 minutes and electrophoresed on 1% agarose/TBE gels to get an approximate idea of the transcript size range.

For hybridization, 200 ul (10 ug cRNA) of a hybridization mix is put on the chip. If multiple hybridizations are to be done (such as cycling through a 5 chip set), then it is recommended that an initial hybridization mix of 300 ul or more be made. The hybridization mix is: fragment labeled RNA (50 ng/ul final conc.); 50 pM 948-b control oligo; 1.5 pM BioB; 5 pM BioC; 25 pM BioD; 100 pM CRE; 0.1 mg/ml herring sperm DNA; 0.5 mg/ml acetylated BSA; and 300 ul with 1xMES hyb buffer.

The hybridization reaction is conducted with non-biotinylated IVT (purified by RNeasy columns) (see example 1 for steps from tissue to IVT): The following mixture is prepared:

IVT antisense RNA; 4 μg:	μl
Random Hexamers (1 μg/μl):	4 μl
H_2O:	μl
	14 μl

Incubate the above 14 μl mixture at 70°C for 10 min.; then put on ice.

The Reverse transcription procedure uses the following mixture:

0.1 M DTT:	3 μl
50X dNTP mix:	0.6 μl
H_2O:	2.4 μl
Cy3 or Cy5 dUTP (1mM):	3 μl
SS RT II (BRL):	1 μl
	16 μl

The above solution is added to the hybridization reaction and incubated for 30 min., 42°C. Then, 1 μl SSII is added and incubated for another hour before being placed on ice.

The 50X dNTP mix contains 25mM of cold dATP, dCTP, and dGTP, 10mM of dTTP and is made by adding 25 μl each of 100mM dATP, dCTP, and dGTP; 10 μl of 100mM dTTP to 15 μl H_2O.]

RNA degradation is performed as follows. Add 86 μl H2O, 1.5 μl 1M NaOH/ 2 mM EDTA and incubate at 65°C, 10 min.. For U-Con 30, 500 μl TE/sample spin at 7000 g for 10 min, save flow through for purification. For Qiagen purification, suspend u-con recovered material in 500 μl buffer PB and proceed using Qiagen protocol. For DNAse digestion, add 1 ul of 1/100 dilution of DNAse/30 ul Rx and incubate at 37°C for 15 min. Incubate at 5 min 95°C to denature the DNAse.

Sample preparation

For sample preparation, add Cot-1 DNA, 10 μl; 50X dNTPs, 1 μl; 20X SSC, 2.3 μl; Na pyro phosphate, 7.5 μl; 10 mg/ml Herring sperm DNA; 1 ul of 1/10 dilution to 21.8 final vol. Dry in speed vac. Resuspend in 15 μl H_20. Add 0.38 μl 10% SDS. Heat

95°C, 2 min and slow cool at room temp. for 20 min. Put on slide and hybridize overnight at 64°C. Washing after the hybridization: 3X SSC/0.03% SDS: 2 min., 37.5 ml 20X SSC+0.75ml 10% SDS in 250ml H_2O; 1X SSC: 5 min., 12.5 ml 20X SSC in 250ml H_2O; 0.2X SSC: 5 min., 2.5 ml 20X SSC in 250ml H_2O. Dry slides and scan at appropiate PMT's and channels.

Example 2: Taxol resistant Xenograft Model of Human Prostate Cancer

Treatment regimens that include paclitaxel (Taxol; Bristol-Myers Squibb Company, Princeton, NJ) have been particularly successful in treating hormone-refractory prostate cancer in the phase II setting (Smith et al., Semin. Oncol. 26(1 Suppl 2):109-11 (1999)). However, many patients develop tumors which are initially, or later become, resistant to taxol. To identify genes that may be involved with resistance to taxol, or are regulated in response to taxol resistance, and therefore may be used to treat, or identify, taxol resistance in patients, the following experiments were carried out.

The androgen-independent human cell line CWR22R was grown as a xenograft in nude mice (Nagabhushan et al., Cancer Res. 56(13):3042-3046 (1996); Agus et al., J. Natl. Cancer Inst.91(21):1869-1876 (1999); Bubendorf et al., J. Natl. Cancer Inst. 91(20):1758-1764 (1999)). Initially, these xenograft tumors were sensitive to therapeutic doses of taxol. The mice were treated continuously with sub-therapeutic doses, and the tumors were allowed to grow for 3-4 weeks, before surgical removal of the tumors. The tumor from an individual mouse was then minced, and a small portion was then injected into a healthy nude mouse, establishing a second

passage of the tumor. This mouse was then treated continuously with the same sub-therapeutic dose of taxol. This process was repeated 14 times, and a portion of each generation of xenograft tumor was collected. There was increasing resistance to therapeutic doses of taxol with each generation. Bythe end of the process, the tumors were fully resistant to therapeutic doses of taxol. RNA from each generation of tumor was then isolated, and individual mRNA species were quantified using a custom Affymetrix GeneChip® oligonucleotide microarray, with probes to interrogate approximately 35,000

unique mRNA transcripts. Genes were selected that showed a statistically significant up-regulation, or down-regulation, during the subsequent generations of increasingly taxol-resistant tumors. Only one gene was significantly up-regulated, whereas 24 genes were down-regulated; these are presented in Table 10.

The gene sequences identified to be overexpressed in prostate cancer may be used to identify coding regions from the public DNA database. The sequences may be used to either identify genes that encode known proteins, or they may be used to predict the coding regions from genomic DNA using exon prediction algorithms, such as FGENESH (Salamov and Solovyev, 2000, Genome Res. 10:516-522). In addition, one of ordinary skill in the art would understand how to obtain the unigene cluster identification and sequence information according to the exemplar accession numbers provided in Tables 1-16. (see, http://www.ncbi.nlm.nih.gov/UniGene/).

TABLE1: shows genes, including expression sequence tags, differentially expressed in prostate tumor tissue compared to normal tissue as analyzed using the Affymetrix/Eos Hu01 GeneChip array. Shown are the relative amounts of each gene expressed in prostate tumor samples and various normal tissue samples showing the highest expression of the gene.

Pkey:	Unique Eos probeset identifier number
ExAccn:	Exemplar Accession number, Genbank accession number
UnigeneID:	Unigene number
Unigene Title:	Unigene gene title
R1:	Ratio of tumor to normal body tissue

Pkey	UnigeneID	ExAccn	Uningene Title	R1
131919	Hs.272458	AA121266	ESTs	37.2
120328	Hs.290905	AA196979	ESTs; Weakly similar to (defline not ava	32.6
105201	Hs.31412	AA195626	ESTs	30.1
101486	Hs.1852	M24902	acid phosphatase; prostate	25.2
119073	Hs.279477	R32894	ESTs	24.8
133428	Hs.183752	M34376	microseminoprotein; beta-	23.8
128180	Hs.171995	AA595348	kallikrein 3; (prostate specific antigen	21.4
104080	Hs.57771	AA402971	Homo sapiens mRNA for serine protease (T	18.9
127537	Hs.162859	AA569531	ESTs	18.6
131665	Hs.30343	R22139	ESTs	17.4
101050	Hs.1832	K01911	neuropeptide Y	17.3
130771	Hs.1915	N48056	folate hydrolase (prostate-specific memb	17
108153	Hs.40808	AA054237	ESTs	16.9
107485	Hs.262476	W63793	S-adenosylmethionine decarboxylase 1	16.7
106155	Hs.33287	AA425309	ESTs	16.5
129534	Hs.11260	R73640	ESTs	16.4
100569	Hs.171995	HG2261-HT2351	Antigen, Prostate Specific, Alt. Splice	16
101889	Hs.181350	S39329	kallikrein 2; prostatic	15.4
135389	Hs.99872	U05237	fetal Alzheimer antigen	15
101506	Hs.62192	M27436	coagulation factor III (thromboplastin;	13.9
134374	Hs.8236	D62633	ESTs	12.7
133944	Hs.7780	AA045870	ESTs	12.5
109141	Hs.193380	AA176428	ESTs	12.3
130974	Hs.2178	X57985	H2B histone family; member Q	11.8
114768	Hs.182339	AA149007	ESTs	11.8
104394	Hs.172129	H46617	yp19h1.r1 Soares breast 3NbHBst Homo sap	11.8
125299	Hs.102720	Z39436	ESTs	11.6
104660	Hs.14846	AA007160	ESTs	11.4
100116	Hs.78045	D00654	actin; gamma 2; smooth muscle; enteric	11
131061	Hs.268744	N64328	ESTs; Moderately similar to KIAA0273 [H.	10.9
126645	126645	AI167942	Homo sapiens BAC clone RG041D11 from 7q2	10.7
135153	Hs.95420	N40141	Homo sapiens mRNA for JM27 protein; comp	10.6
107033	Hs.113314	AA599629	ESTs	10.6
118417		N66048	ESTs; Weakly similar to polymerase [H.sa	10.5
126758	Hs.293960	W37145	ESTs	10.2
115674	Hs.8364	AA406542	ESTs	10.1
134989	Hs.92381	AA236324	ESTs; Weakly similar to !!!! ALU CLASS A	10.1
107102	Hs.30652	AA609723	ESTs	10.1
116767	Hs.15641	H28581	ESTs	10.1
115719	Hs.59622	AA416997	ESTs	10
123209	Hs.203270	AA489711	ESTs	9.9
101664	Hs.121017	M60752	H2A histone family; member A	9.8
112971	Hs.83883	T17185	ESTs	9.7
102519	Hs.80296	U52969	Purkinje cell protein 4	9.7
117984	Hs.106778	N51919	ESTs	9.7
105840	Hs.22209	AA398533	ESTs	9.4
129523	Hs.274509	M30894	T-cell receptor; gamma cluster	9.4
132984	Hs.167133	AA031360	ESTs	9.2
121853	Hs.98502	AA425887	ESTs	9

115764	Hs.91011	AA421562	anterior gradient 2 (Xenopus laevis; sec	8.9
119617	Hs.55999	W47380	ESTs	8.9
100552	Hs.301946	HG2167-HT2237	Protein Kinase Ht31, Camp-Dependent	8.9
105627	Hs.23317	AA281245	ESTs	8.8
101461	Hs.76422	M22430	phospholipase A2; group IIA (platelets;	8.7
131725	Hs.31146	AA456264	ESTs; Highly similar to (defline not ava	8.5
124526	Hs.293185	N62096	yz61c5.s1 Soares_multiple_sclerosis_2NbH	8.5
118528	Hs.49397	N67889	ESTs	8.2
133845	Hs.76704	T68510	ESTs	8.2
133354	Hs.334762	AA055552	ESTs; Weakly similar to KIAA0319 [H.sapi	8.1
105912	Hs.20415	AA402000	ESTs; Weakly similar to GS3786 [H.sapien	8
119018	Hs.278695	N95796	ESTs	8
100394	Hs.66052	D84276	CD38 antigen (p45)	8
114132	Hs.24192	Z38688	ESTs	7.9
116786	Hs.301527	H25836	tumor necrosis factor (ligand) superfami	7.7
106579	Hs.23023	AA458135	ESTs	7.6
128790	Hs.105700	AA291725	secreted frizzled-related protein 4	7.5
114965	Hs.72472	AA250737	ESTs	7.4
112033	Hs.22627	R43162	ESTs	7.1
102398		U42359	Human N33 protein form 1 (N33) gene, exo	7
101201	Hs.2256	L22524	matrix metalloproteinase 7 (matrilysin;	6.9
109272	Hs.288462	AA195718	ESTs	6.9
103145	Hs.169849	X66276	myosin-binding protein C; slow-type	6.9
101803	Hs.155691	M86546	pre-B-cell leukemia transcription factor	6.8
120562	Hs.302267	AA280036	ESTs; Weakly similar to W01A6.c [C.elega	6.8
109112	Hs.257924	AA169379	ESTs	6.8
109795	Hs.326416	F10707	ESTs	6.7
107532	Hs.173684	Z19643	ESTs; Weakly similar to (defline not ava	6.7
130336	Hs.171995	X07730	kallikrein 3; (prostate specific antigen	6.6
131425	Hs.26691	AA219134	ESTs	6.6
120588	Hs.16193	AA281591	Homo sapiens mRNA; cDNA DKFZp586B211 (fr	6.6
132902	Hs.59838	AA490969	ESTs	6.6
125674	Hs.323378	W28078	H.sapiens mRNA for transmembrane protein	6.6
133724	Hs.75746	U07919	aldehyde dehydrogenase 6	6.5
130343	Hs.278628	AA490262	ESTs; Moderately similar to APXL gene pr	6.5
120215	Hs.108787	Z41050	Homo sapiens Mcd4p homolog mRNA; complet	6.5
129215	Hs.126085	AA176867	ESTs	6.5
131881	Hs.3383	AA010163	upstream regulatory element binding prot	6.5
133376	Hs.7232	T23670	ESTs	6.4
105376	Hs.8768	AA236559	ESTs; Weakly similar to neuronal thread	6.4
104874	Hs.26289	AA009527	ESTs	6.4
100727	Hs.334786	X07290	Human HF.12 gene mRNA	6.3
130150	Hs.15113	AF000573	homogentisate 1;2-dioxygenase (homogenti	6.3
121770	Hs.278428	AA421714	Homo sapiens mRNA for KIAA0896 protein;	6.3
123475	Hs.250528	AA599267	ESTs; Weakly similar to ANKYRIN; BRAIN V	6.3
133061	Hs.296638	AB000584	prostate differentiation factor	6.3
116429	Hs.279923	AA609710	ESTs; Weakly similar to similar to GTP-b	6.2
101233	Hs.878	L29008	sorbitol dehydrogenase	6.2
104691	Hs.37744	AA011176	ESTs	6.2
127248		AA325029	EST27953 Cerebellum II Homo sapiens cDNA	6.2
127775	Hs.179902	H04108	ESTs; Weakly similar to (defline not ava	6.2
105500	Hs.222399	AA256485	ESTs	6.1
131463	Hs.2714	X74142	forkhead (Drosophila)-like 1	6.1
132116	Hs.40289	AA234787	ESTs	6
130828	Hs.203213	AA053400	ESTs	5.9
115357	Hs.72988	AA281793	ESTs	5.8
105496	Hs.301997	AA256323	ESTs	5.7
116334	Hs.48948	AA491457	ESTs	5.7
107968	Hs.61539	AA034020	ESTs	5.7
120132	Hs.125019	Z38839	ESTs; Weakly similar to !!!! ALU SUBFAMI	5.6
106375	Hs.289072	AA443993	ESTs	5.6
132550	Hs.170195	AA029597	bone morphogenetic protein 7 (osteogenic	5.6
124777	Hs.140237	R41933	ESTs; Weakly similar to neuronal thread	5.6
100311	Hs.337616	D50640	phosphodiesterase 3B; cGMP-inhibited	5.6
101791	Hs.62354	M83822	Human beige-like protein (BGL) mRNA; par	5.5
117698	Hs.45107	N41002	ESTs	5.5
132387	Hs.281434	R70914	heat shock 70kD protein 1	5.5
122041	Hs.98732	AA431407	Homo sapiens Chromosome 16 BAC clone CIT	5.5
133723	Hs.262476	AA088851	S-adenosylmethionine decarboxylase 1	5.5

113938		W81598	ESTs	5.4
133015	Hs.246315	AA047036	ESTs	5.4
125745	Hs.75722	AI283493	ribophorin II	5.4
107295	Hs.80120	T34527	UDP-N-acetyl-alpha-D-galactosamine:polyp	5.4
108186	Hs.7780	AA056482	ESTs	5.3
100184	Hs.21223	D17408	calponin 1; basic; smooth muscle	5.3
104466	Hs.326392	N25110	Human guanine nucleotide exchange factor	5.3
104033	Hs.98944	AA365031	ESTs	5.3
110844	Hs.167531	N31952	ESTs; Weakly similar to (define not ava	5.3
129056	Hs.108338	H70627	ESTs; Weakly similar to !!!! ALU SUBFAMI	5.3
102805	Hs.25351	U90304	Iroquois-class homeodomain protein	5.3
133493	Hs.194369	AA284143	Homo sapiens chromosome 1 atrophin-1 rel	5.3
129184	Hs.109201	W26769	ESTs; Highly similar to (define not ava	5.2
134158	Hs.79428	U15174	BCL2/adenovirus E1B 19kD-interacting pro	5.2
107240	Hs.159872	D59368	ESTs	5.2
104787		AA027317	ESTs; Weakly similar to !!!! ALU SUBFAMI	5.2
123527	Hs.108327	AA608679	damage-specific DNA binding protein 1 (1	5.2
116646	Hs.194228	F03048	ESTs; Moderately similar to !!!! ALU SUB	5.2
101448	Hs.195850	M21389	keratin 5 (epidermolysis bullosa simplex	5.1
116188	Hs.184598	AA464728	ESTs; Weakly similar to !!!! ALU SUBFAMI	5.1
126259	Hs.281428	Z21472	ESTs; Moderately similar to !!!! ALU SUB	5.1
105921	Hs.169119	AA402613	ESTs	5.1
103375	Hs.54416	X91868	sine oculis homeobox (Drosophila) homolo	5.1
128871	Hs.106778	AA400271	ESTs; Highly similar to (define not ava	5.1
112681	Hs.148932	R87331	ESTs; Moderately similar to semaphorin V	5.1
105784	Hs.226434	AA350771	ESTs	5.1
116238	Hs.47144	AA479362	ESTs	5
102913	Hs.80342	X07696	keratin 15	5
103011	Hs.326035	X52541	early growth response 1	5
126023		H58881	yr36d09.r1 Soares fetal liver spleen 1NF	5
103709	Hs.13804	AA037316	ESTs	5
118981	Hs.39288	N93839	ESTs; Weakly similar to !!!! ALU SUBFAMI	5
134807	Hs.89732	X78932	zinc finger protein 273	5
100079	Hs.23311	AB002365	Human mRNA for KIAA0367 gene; partial cd	4.9
132047	Hs.3796	D83492	EphB6	4.9
132880	Hs.177537	AA444369	ESTs	4.9
124049	Hs.74519	F10523	primase; polypeptide 2A (58kD)	4.8
133330	Hs.71119	U42360	Human N33 mRNA; complete cds	4.8
104776		AA026349	ESTs	4.8
122593	Hs.128749	AA453310	Homo sapiens alpha-methylacyl-CoA racema	4.8
103912	Hs.143087	AA251078	ESTs	4.8
113961	Hs.26009	W86307	Homo sapiens mRNA for KIAA0860 protein;	4.8
105288	Hs.3585	AA233168	ESTs; Weakly similar to coded for by C.	4.8
135035	Hs.284186	H89575	ESTs	4.8
104144	Hs.183390	AA447439	ESTs; Weakly similar to ZINC FINGER PROT	4.8
129389	Hs.288126	AA621604	ESTs	4.8
125982		R98091	RAE1 (RNA export 1; S.pombe) homolog	4.8
125162	Hs.26243	W44682	ESTs	4.8
103023	Hs.117950	X53793	multifunctional polypeptide similar to S	4.7
129735		W80701	ESTs; Weakly similar to HERV-E envelope	4.7
104479	Hs.106390	N36040	ESTs	4.7
103731		AA070545	zm7c3.r1 Stratagene neuroepithelium (#93	4.7
126575	Hs.127602	W72416	ESTs	4.7
124578	Hs.231500	N68321	Human glucose transporter-like protein-I	4.7
130617	Hs.1674	M90516	glutamine-fructose-6-phosphate transamin	4.7
116752	Hs.91622	H06373	Homo sapiens clone 24456 mRNA sequence	4.7
100279	Hs.82007	D42084	Human mRNA for KIAA0094 gene; partial cd	4.7
126288	Hs.89576	AI479264	ESTs	4.7
131836	Hs.32990	AA610086	ESTs	4.7
106717	Hs.239489	AA465093	TIA1 cytotoxic granule-associated RNA-bi	4.7
114542	Hs.91011	AA055768	ESTs	4.6
103806		AA130614	zo1f2.r1 Stratagene neuroepithelium NT2R	4.6
130529		AA173238	small inducible cytokine A5 (RANTES)	4.6
115675	Hs.82065	AA406546	ESTs	4.6
111386	Hs.293798	N95326	ESTs	4.6
106503	Hs.29679	AA452411	ESTs	4.6
119943	Hs.14158	W86835	copine III	4.6
104459	Hs.100070	M91493	EST	4.6
100774	Hs.89603	HG371-HT1063	Mucin 1, Epithelial, Alt. Splice 6	4.6

100652	Hs.142653	HG2825-HT2949	Ret Transforming Gene	4.6
132015	Hs.3731	D11900	ESTs	4.6
126086		H70975	yr73g01.r1 Soares fetal liver spleen 1NF	4.6
130888	Hs.173094	F03819	ESTs	4.6
106390	Hs.20166	AA446964	Prostate stem cell antigen	4.6
126959		AA199853	ESTs; Moderately similar to !!!! ALU SUB	4.5
131584	Hs.29117	X91648	H.sapiens mRNA for pur alpha extended 3'	4.5
104838	Hs.20953	AA039481	ESTs	4.5
125681		R50319	ESTs	4.5
103171	Hs.234726	X68733	alpha-1-antichymotrypsin	4.5
103928	Hs.199160	AA280085	ESTs	4.5
102899	Hs.75730	X06272	signal recognition particle receptor ('d	4.5
100892	Hs.180789	HG4557-HT4962	Small Nuclear Ribonucleoprotein U1, 1snr	4.5
106167	Hs.7956	AA425906	ESTs	4.5
129404	Hs.317584	AA172056	ESTs	4.5
106990	Hs.24758	AA521354	ESTs	4.5
132316	Hs.44566	U28831	Human protein immuno-reactive with anti-	4.4
132056	Hs.38176	T89386	Homo sapiens mRNA for KIAA0606 protein;	4.4
133718	Hs.198760	X15306	neurofilament; heavy polypeptide (200kD)	4.4
101470	Hs.1846	M22898	tumor protein p53 (Li-Fraumeni syndrome)	4.4
131904	Hs.284296	AA143019	ESTs; Highly similar to surface 4 integr	4.4
105804	Hs.22514	AA383142	ESTs	4.4
122861	Hs.119394	AA464428	ESTs	4.4
111336	Hs.29894	N79565	ESTs	4.4
121944	Hs.98518	AA429278	ESTs	4.4
134401	Hs.211577	AA243746	ESTs; Highly similar to CG1 protein [H.s	4.4
126458	Hs.288969	AA815252	ESTs; Weakly similar to !!!! ALU SUBFAMI	4.4
133435	Hs.323966	T23983	ESTs; Moderately similar to !!!! ALU SUB	4.4
105178	Hs.21941	AA187490	ESTs	4.3
127315		AA640834	nr27b06.r1 NCI_CGAP_Pr3 Homo sapiens cDN	4.3
132645	Hs.54424	X87870	H.sapiens mRNA for hepatocyte nuclear fa	4.3
116162	Hs.282990	AA461487	ESTs; Weakly similar to F52C12.2 [C.eleg	4.3
118040	Hs.47567	N52876	EST	4.3
130008	Hs.278427	M31423	cerebellar degeneration-related protein	4.3
126607	Hs.114688	W87424	ESTs	4.3
123061	Hs.105130	AA482030	EST	4.3
109391	Hs.184245	AA219699	ESTs	4.3
109175		AA180496	ESTs	4.3
127003	Hs.173540	AA550806	ESTs; Weakly similar to (define not ava	4.3
102547	Hs.46638	U57911	chromosome 11 open reading frame 8	4.3
134208	Hs.79993	U88871	peroxisomal biogenesis factor 7	4.3
104258	Hs.5462	AF007216	solute carrier family 4; sodium bicarbon	4.3
130759	Hs.18946	AA094720	ESTs; Weakly similar to (define not ava	4.3
132160	Hs.295923	AA281770	seven in absentia (Drosophila) homolog 1	4.3
135062	Hs.93872	AA174183	ESTs	4.3
126510	Hs.334762	R49702	ESTs; Weakly similar to KIAA0319 [H.sapi	4.2
122055	Hs.98747	AA431732	EST	4.2
133136	Hs.6574	AF007165	suppressin (nuclear deformed epidermal a	4.2
109890	Hs.20843	H04649	ESTs	4.2
133294	Hs.69997	R79723	H.sapiens mRNA for translin associated z	4.2
134436	Hs.83190	S80437	fatty acid synthase {3' region} [human,	4.2
107375	Hs.251064	U88573	NBR2	4.2
122223	Hs.27413	AA436158	ESTs	4.2
103044	Hs.248210	X55777	H.sapiens Mahlavu hepatocellular carcino	4.2
120125	Hs.59815	W99362	EST	4.2
128969	Hs.283978	T65327	ESTs; Highly similar to (define not ava	4.2
129637	Hs.1179	D90359	TATA box binding protein (TBP)-associate	4.2
106566		AA455921	ESTs; Weakly similar to !!!! ALU SUBFAMI	4.2
112605	Hs.29852	R79220	ESTs	4.2
103364	Hs.279929	X90872	H.sapiens mRNA for gp25L2 protein	4.2
132811	Hs.57419	U25435	transcriptional repressor	4.2
126570	Hs.326292	T79274	ESTs	4.2
116298	Hs.94109	AA489046	ESTs	4.2
103024	Hs.105938	X53961	lactotransferrin	4.1
129133	Hs.108850	R56728	yg95c6.r1 Soares infant brain 1NIB Homo	4.1
133167	Hs.6641	N98707	kinesin family member 5C	4.1
126871	Hs.14051	AA351779	ESTs	4.1
132333	Hs.45032	AA192157	ESTs	4.1
107376	Hs.327179	U90545	solute carrier family 17 (sodium phospha	4.1

128517	Hs.100861	AA280617	ESTs; Weakly similar to p60 katanin [H.s	4.1
130555	Hs.116774	AA450324	ESTs	4.1
105765	Hs.24183	AA343514	ESTs	4.1
126529	Hs.26369	AA133237	ESTs	4.1
125928	Hs.181889	H29730	ESTs	4.1
117280	Hs.172129	N22107	ESTs; Moderately similar to !!!! ALU SUB	4.1
100234	Hs.3085	D29677	KIAA0054 gene product	4.1
100959	Hs.118127	J00073	actin; alpha; cardiac muscle	4.1
107130	Hs.12913	AA620582	ESTs; Weakly similar to (defline not ava	4.1
105035	Hs.8859	AA128486	ESTs	4.1
126735	Hs.226795	AA808949	glutathione S-transferase pi	4.1
113056	Hs.8036	T26471	ESTs; Moderately similar to !!!! ALU SUB	4
102460	Hs.211582	U48959	Homo sapiens myosin light chain kinase (	4
106968	Hs.26813	AA504631	ESTs; Weakly similar to (defline not ava	4
123107	Hs.104207	AA486071	ESTs	4
127256	Hs.267967	AA327550	ESTs; Weakly similar to !!!! ALU SUBFAMI	4
105329	Hs.22862	AA234561	ESTs	4
115504	Hs.42736	AA291946	ESTs	4
120728	Hs.97293	AA293656	ESTs	4
103576	Hs.94560	Z26317	desmoglein 2	4
127889	Hs.144941	AI147408	ESTs	4
108394	Hs.25320	AA447223	ESTs	4
128046		AA873285	ESTs	4
103391	Hs.114366	X94453	pyrroline-5-carboxylate synthetase (glut	4
106448	Hs.27004	AA449455	ESTs	4
126513	Hs.86276	W27601	ESTs; Moderately similar to (defline not	4
129593	Hs.98314	AA487015	ESTs; Weakly similar to !!!! ALU SUBFAMI	3.9
110151	Hs.31608	H18836	ESTs	3.9
105344	Hs.8645	AA235303	ESTs	3.9
104791	Hs.301871	AA029046	ESTs	3.9
123442	Hs.111496	AA598803	ESTs	3.9
127800	Hs.79428	AA521047	BCL2/adenovirus E1B 19kD-interacting pro	3.9
114555	Hs.167904	AA058594	ESTs	3.9
122138	Hs.163960	AA435549	ESTs	3.9
129565	Hs.198726	X77777	vasoactive intestinal peptide receptor 1	3.9
103471	Hs.75216	Y00815	protein tyrosine phosphatase; receptor t	3.9
133908	Hs.325474	M83216	caldesmon 1	3.9
105635	Hs.301985	AA281508	ESTs	3.9
134285	Hs.81086	AA460012	solute carrier family 22 (organic cation	3.9
134125	Hs.50421	R38102	KIAA0203 gene product	3.9
125628	Hs.241493	AA418069	natural killer-tumor recognition sequenc	3.9
103695	Hs.186600	AA018758	ESTs	3.9
100642	Hs.182183	HG2743-HT3926	Caldesmon 1, Alt. Splice 6, Non-Muscle	3.9
104334	Hs.78771	D82614	ESTs	3.9
110242	Hs.19978	H26417	ESTs	3.9
125298	Hs.289008	Z39255	ESTs	3.9
104060	Hs.303193	AA397968	zt87a9.r1 Soares_testis_NHT Homo sapiens	3.9
105823	Hs.293960	AA398197	ESTs	3.9
126499	Hs.110445	AA315671	ESTs; Moderately similar to unknown [M.m	3.9
130752	Hs.18895	D50927	KIAA0137 gene product	3.8
123494	Hs.112110	AA599786	ESTs	3.8
104846	Hs.32478	AA040154	ESTs	3.8
108921	Hs.71721	AA142913	ESTs	3.8
115506	Hs.45207	AA292537	ESTs	3.8
100452	Hs.241552	D87742	Human mRNA for KIAA0268 gene; partial cd	3.8
104454	Hs.129228	M84443	galactokinase 2	3.8
108730	Hs.102859	AA126254	ESTs	3.8
131223	Hs.24427	AA247788	ESTs; Highly similar to (defline not ava	3.8
104784	Hs.269228	AA027055	ESTs	3.8
104946	Hs.73848	AA069549	ESTs	3.8
106932	Hs.9394	AA495926	ESTs	3.8
101724	Hs.620	M69225	bullous pemphigoid antigen 1 (230/240kD)	3.8
106140	Hs.14912	AA424524	Homo sapiens mRNA for KIAA0286 gene; par	3.8
128135	Hs.269721	AA913491	ESTs	3.8
120030	Hs.58694	W92051	ESTs	3.8
126457	Hs.50382	AA007489	zh98g04.r1 Soares_fetal_liver_spleen_1NF	3.8
123917	Hs.112969	AA621311	EST	3.7
110714	Hs.17752	H95978	Homo sapiens phosphatidylserine-specific	3.7
130577	Hs.162	M35410	insulin-like growth factor binding prote	3.7

117667	Hs.44708	N39214	ser-Thr protein kinase related to the my	3.7
128104	Hs.39712	N77278	ESTs; Weakly similar to BONE/CARTILAGE P	3.7
100379	Hs.278721	D82060	Homo sapiens mRNA for membrane protein w	3.7
115646	Hs.305971	AA404352	ESTs	3.7
125792	Hs.193700	AI005388	ESTs; Moderately similar to !!!! ALU SUB	3.7
102162	Hs.1592	U18291	CDC16 (cell division cycle 16; S. cerevi	3.7
128530	Hs.183475	AA504343	ESTs; Moderately similar to !!!! ALU SUB	3.7
119940	Hs.272531	W86779	EST	3.7
110769	Hs.23837	N22222	yw34b08.s1 Morton Fetal Cochlea Homo sap	3.7
132914	Hs.60293	AA496037	ESTs	3.7
113594	Hs.15683	T92030	ESTs	3.7
103702	Hs.279952	AA027793	ESTs; Highly similar to (defline not ava	3.7
130780	Hs.19347	AA248406	ESTs	3.7
123288	Hs.291025	AA495836	EST	3.7
120691	Hs.22380	AA291173	ESTs	3.7
103153	Hs.75295	X66534	guanylate cyclase 1; soluble; alpha 3	3.7
129201	Hs.109390	H19969	ESTs	3.7
114798	Hs.54900	AA159181	ESTs	3.7
126801	Hs.7337	AA512902	ESTs	3.7
105503	Hs.31707	AA256616	ESTs	3.7
104260	Hs.194283	AF008192	Homo sapiens putative GR6 protein (GR6)	3.7
125980	Hs.35699	R97219	ESTs	3.7
123255	Hs.105273	AA490890	ESTs	3.6
103862	Hs.6363	AA206625	ESTs	3.6
100696	Hs.121686	HG3162-HT3339	Transcription Factor IIa	3.6
134917	Hs.166994	X87241	FAT tumor suppressor (Drosophila) homolo	3.6
103520		Y10511	H.sapiens mRNA for CD176 protein	3.6
113776	Hs.302738	W15263	ESTs	3.6
101838	Hs.75511	M92934	connective tissue growth factor	3.6
113702		T97307	ESTs; Moderately similar to !!!! ALU SUB	3.6
118201	Hs.48428	N59800	EST	3.6
116519	Hs.68554	C20780	EST	3.6
105886	Hs.22983	AA400517	ESTs; Moderately similar to UDP-GLUCOSE:	3.6
106709	Hs.170291	AA464696	ESTs	3.6
127858	Hs.27973	AA806365	oc26h07.s1 NCI_CGAP_GCB1 Homo sapiens cD	3.6
101964		S81578	dioxin-responsive gene {putative polyade	3.6
105508	Hs.326416	AA256680	ESTs	3.6
116844	Hs.337434	H64938	ESTs	3.6
105372	Hs.142296	AA236481	ESTs	3.6
100745	Hs.144630	HG3510-HT3704	V-Erba Related Ear-3 Protein	3.6
127521	Hs.164018	AA809982	ESTs	3.6
110758	Hs.274265	N21365	talin	3.6
107307	Hs.44155	T52099	creatine kinase; mitochondrial 2 (sarcom	3.6
133200	Hs.183639	AA432248	ESTs	3.6
114774	Hs.184325	AA150043	ESTs	3.6
120265	Hs.270696	AA173759	ESTs; Moderately similar to !!!! ALU SUB	3.6
134359	Hs.199067	M34309	v-erb-b2 avian erythroblastic leukemia v	3.6
116250	Hs.44829	AA480975	ESTs; Moderately similar to !!!! ALU SUB	3.6
106313	Hs.35841	AA436459	nuclear factor I/X (CCAAT-binding transc	3.6
131898	Hs.279780	N52232	ESTs	3.6
133444	Hs.73793	M27281	vascular endothelial growth factor	3.6
128232	Hs.334641	H06296	ESTs	3.6
135357	Hs.79572	AA235803	ESTs	3.5
457951		AI369384	arylsulfatase D	3.5
108407		AA075519	zm87h9.s1 Stratagene ovarian cancer (#93	3.5
126659		T16245	a disintegrin and metalloproteinase doma	3.5
104189	Hs.301804	AA485805	ESTs	3.5
125956	Hs.129014	N53276	ESTs	3.5
103026	Hs.79386	X54162	Human mRNA for a 64 Kd autoantigen expre	3.5
133011	Hs.171921	AA042990	sema domain; immunoglobulin domain (Ig);	3.5
131379	Hs.26176	R49035	ESTs	3.5
126742	Hs.169359	H64106	yr57e06.r1 Soares fetal liver spleen 1NF	3.5
105560	Hs.306915	AA262783	ESTs	3.5
118472	Hs.42179	N68818	ESTs	3.5
105623	Hs.30127	AA280895	ESTs; Highly similar to !!!! ALU SUBFAMI	3.5
120262	Hs.145807	AA172076	ESTs; Moderately similar to !!!! ALU SUB	3.5
105027	Hs.26771	AA128472	ESTs	3.5
130760	Hs.18953	AA128997	phosphodiesterase 9A	3.5
117473	Hs.155560	N30157	ESTs	3.5

102663	Hs.168075	U70322	karyopherin (importin) beta 2	3.5
126349	Hs.13531	AA442868	ESTs; Weakly similar to (define not ava	3.5
132154	Hs.41119	N67179	ESTs	3.5
131689	Hs.30696	AA599653	transcription factor-like 5 (basic helix	3.5
127862	Hs.163191	AA765305	EST	3.5
126995	Hs.189810	W26950	Human DNA sequence from PAC 388M5 on chr	3.5
119071		R31180	ESTs	3.5
103941	Hs.96593	AA282978	ESTs	3.5
110721	Hs.31319	H97678	ESTs	3.5
126586	Hs.43086	AA011247	ESTs	3.5
103106	Hs.1857	X62025	phosphodiesterase 6G; cGMP-specific; rod	3.5
116357	Hs.90797	AA504806	Homo sapiens clone 23620 mRNA sequence	3.5
105309	Hs.4104	AA233780	ESTs	3.5
130796	Hs.19525	R39390	ESTs	3.5
109101	Hs.52184	AA167708	ESTs	3.5
103134	Hs.2839	X65724	Norrie disease (pseudoglioma)	3.5
131798	Hs.301449	X86098	adenovirus 5 E1A binding protein	3.5
118535	Hs.49418	N67968	ESTs	3.5
102592	Hs.11223	U82389	Human putative cytosolic NADP-dependent	3.4
125905	Hs.6456	T69868	chaperonin containing TCP1; subunit 2 (b	3.4
109160	Hs.301997	AA179387	ESTs	3.4
105327	Hs.211593	AA234440	ESTs	3.4
106586	Hs.57787	AA456598	ESTs	3.4
122635		AA454085	EST	3.4
132413	Hs.260116	AA132969	metalloprotease 1 (pitrilysin family)	3.4
131938	Hs.34956	AA283620	ESTs	3.4
133871	Hs.182793	AA454597	ESTs	3.4
107175	Hs.292503	AA621751	ESTs; Weakly similar to KIAA0601 protein	3.4
101188	Hs.184298	L20320	cyclin-dependent kinase 7 (homolog of Xe	3.4
126422	Hs.237658	H48518	ESTs; Highly similar to apolipoprotein A	3.4
118475		N66845	ESTs; Weakly similar to !!!! ALU CLASS B	3.4
104558	Hs.88959	R56678	ESTs; Weakly similar to !!!! ALU SUBFAMI	3.4
128307	Hs.132005	AI453794	ESTs	3.4
112254	Hs.25829	R51831	ESTs	3.4
125408	Hs.89578	N72353	yv37e12.r1 Soares fetal liver spleen 1NF	3.4
109834	Hs.175955	H00604	ESTs	3.4
130844	Hs.20191	D12122	seven in absentia (Drosophila) homolog 2	3.4
127143	Hs.20843	AA533553	nj68h04.s1 NCI_CGAP_Pr10 Homo sapiens cD	3.4
135309	Hs.42500	D25984	ESTs	3.4
125724	Hs.295978	AA083407	stimulated trans-acting factor (50 kDa)	3.4
127692	Hs.187983	AI021912	ESTs	3.4
116674	Hs.92127	F04816	ESTs	3.4
134700	Hs.8868	AA481414	golgi SNAP receptor complex member 1	3.4
114846	Hs.166196	AA234929	ESTs	3.4
103649	Hs.155983	Z70219	H.sapiens mRNA for 5'UTR for unknown pro	3.4
134835	Hs.89925	L04569	calcium channel; voltage-dependent; L ty	3.4
130568	Hs.16085	AA232535	ESTs; Highly similar to (define not ava	3.4
111331	Hs.15978	N78773	ESTs	3.4
106036	Hs.10653	AA412505	ESTs	3.4
130987	Hs.21893	R45698	ESTs	3.4
112814	Hs.35828	R98192	ESTs	3.4
127815	Hs.255015	AA876009	ob93c10.s1 NCI_CGAP_GCB1 Homo sapiens cD	3.4
100144	Hs.75616	D13643	KIAA0018 gene product	3.4
101129	Hs.247992	L10405	Homo sapiens DNA binding protein for sur	3.4
130874	Hs.20621	T08287	ESTs	3.4
106882	Hs.26994	AA489009	ESTs	3.4
103855	Hs.302267	AA195179	ESTs	3.4
125957		H45213	yo03b08.r1 Soares adult brain N2b5HB55Y	3.3
114048	Hs.146085	W94613	ESTs	3.3
109826	Hs.75354	F13702	ESTs	3.3
125355	Hs.170098	R45630	ESTs; Highly similar to KIAA0372 [H.sapi	3.3
104182	Hs.143792	AA479990	ESTs; Weakly similar to glioma amplified	3.3
100294	Hs.75454	D49396	Human mRNA for Apo1_Human (MER5(Aop1-Mou	3.3
131688	Hs.30692	U24153	p21 (CDKN1A)-activated kinase 2	3.3
116256	Hs.88201	AA481256	ESTs; Weakly similar to (define not ava	3.3
102034	Hs.230	U05291	fibromodulin	3.3
130072	Hs.14658	R99606	Human chromosome 5q13.1 clone 5G8 mRNA	3.3
114615	Hs.159456	AA083812	ESTs; Highly similar to (define not ava	3.3
128707	Hs.104105	AA136474	Meis (mouse) homolog 2	3.3

115048	Hs.190057	AA252668	ESTs	3.3
125862	Hs.31110	H12084	ESTs	3.3
135142	Hs.24192	R31679	ESTs	3.3
103119	Hs.2877	X63629	cadherin 3; P-cadherin (placental)	3.3
104460	Hs.62604	M91504	ESTs	3.3
100365	Hs.79284	D78611	mesoderm specific transcript (mouse) hom	3.3
131524	Hs.301804	N39152	ESTs	3.3
102165	Hs.159627	U18321	Death associated protein 3	3.3
126966	Hs.182575	R38438	solute carrier family 15 (H+/peptide tra	3.3
124839	Hs.140942	R55784	ESTs	3.3
100709	Hs.100469	HG3264-HT3441	Af-6 (Gb:U02478)	3.3
132967	Hs.61635	AA032221	Homo sapiens BAC clone RG041D11 from 7q2	3.3
102927	Hs.65114	X12876	keratin 18	3.3
132616	Hs.283558	AA386264	ESTs	3.3
125132	Hs.129781	W15495	ESTs	3.3
111225	Hs.31652	N68989	ESTs	3.3
114956	Hs.87113	AA243681	ESTs	3.3
122235	Hs.112227	AA436475	ESTs	3.3
112325	Hs.12315	R56055	ESTs	3.3
123360	Hs.178604	AA504784	ESTs	3.3
105150	Hs.155995	AA169640	Homo sapiens mRNA for KIAA0643 protein;	3.3
107391	Hs.284294	W02877	ESTs	3.3
113058	Hs.7569	T26893	EST	3.3
134371	Hs.82318	S69790	Brush-1	3.3
125669	Hs.333256	R51308	ESTs; Moderately similar to !!!! ALU SUB	3.3
111506	Hs.294105	R07726	ESTs	3.3
122974	Hs.194215	AA478625	ESTs	3.3
102369	Hs.299867	U39840	hepatocyte nuclear factor 3; alpha	3.3
120408	Hs.190151	AA235045	ESTs	3.3
117993	Hs.47402	N52039	ESTs; Weakly similar to !!!! ALU SUBFAMI	3.3
129586	Hs.11500	AA437118	ESTs	3.3
128138	Hs.126494	AI200825	ESTs	3.3
127265		AA332751	EST37214 Embryo, 8 week I Homo sapiens c	3.3
107674	Hs.41143	AA011027	Homo sapiens mRNA for KIAA0581 protein;	3.2
104866	Hs.293691	AA045342	ESTs	3.2
103427	Hs.250655	X97303	H.sapiens mRNA for Ptg-12 protein	3.2
132990	Hs.334334	AA458761	ESTs	3.2
127017	Hs.251946	AA740146	ESTs	3.2
132313	Hs.44481	U13220	forkhead (Drosophila)-like 6	3.2
106880	Hs.32425	AA488889	ESTs	3.2
107039	Hs.169780	AA599751	homologous to yeast nitrogen permease (c	3.2
120870	Hs.292581	AA357172	ESTs	3.2
107920	Hs.284207	AA027951	ESTs	3.2
104165	Hs.105116	AA459160	EST	3.2
107012	Hs.63908	AA598745	ESTs	3.2
103605	Hs.194657	Z35402	H.sapiens gene encoding E-cadherin, exon	3.2
124006	Hs.270016	D60302	ESTs	3.2
101300	Hs.74137	L40391	Homo sapiens (clone s153) mRNA fragment	3.2
101183	Hs.795	L19779	H2A histone family; member O	3.2
125598		R25698	yg44h11.r2 Soares infant brain 1NIB Homo	3.2
127261		AA661567	nu86b02.s1 NCI_CGAP_Alv1 Homo sapiens cD	3.2
120090	Hs.59554	W94591	ESTs	3.2
129393	Hs.166982	D13435	phosphatidylinositol glycan; class F	3.2
120923	Hs.97129	AA382283	ESTs	3.2
118907	Hs.274256	N91003	ESTs	3.2
111552	Hs.191185	R09411	ESTs	3.2
104431	Hs.99913	J03019	adrenergic; beta-1-; receptor	3.2
133551	Hs.278634	D63480	Human mRNA for KIAA0146 gene; partial cd	3.2
131615	Hs.192803	D14533	xeroderma pigmentosum; complementation g	3.2
126547	Hs.84072	U47732	transmembrane 4 superfamily member 3	3.2
103172	Hs.116774	X68742	integrin; alpha 1	3.2
113867	Hs.24095	W68845	ESTs	3.2
133323	Hs.70937	Z83735	H3 histone family; member K	3.2
111597	Hs.189716	R11499	ESTs	3.2
121515	Hs.104696	AA412133	ESTs	3.2
107445	Hs.6639	W28406	ESTs	3.2
106887	Hs.334335	AA489091	ESTs	3.2
123052	Hs.185766	AA481806	ESTs	3.2
107072	Hs.130760	AA609113	Homo sapiens mRNA; cDNA DKFZp586N0318 (f	3.2

102214	Hs.32964	U23752	SRY (sex-determining region Y)-box 11	3.2
123147		AA487961	ab11h6.s1 Stratagene lung (#93721) Homo	3.2
125435	Hs.272138	R00940	ye87g03.r1 Soares fetal liver spleen 1NF	3.2
116246	Hs.250646	AA479961	ESTs; Highly similar to ubiquitin-conjug	3.2
105169	Hs.180789	AA180321	Homo sapiens (clone S164) mRNA; 3' end o	3.2
134001	Hs.78344	AF001548	myosin; heavy polypeptide 11; smooth mus	3.2
124866	Hs.304389	R68571	ESTs	3.2
133205	Hs.67619	AA089559	Homo sapiens mRNA; chromosome 1 specific	3.2
102988	Hs.182378	X17648	colony stimulating factor 1 (macrophage)	3.2
101232	Hs.242894	L28997	ADP-ribosylation factor-like 1	3.1
132906	Hs.234896	AA142857	ESTs; Highly similar to geminin [H.sapie	3.1
104281	Hs.5669	C14290	ESTs	3.1
123926	Hs.227933	AA621348	ESTs; Highly similar to (define not ava	3.1
134464	Hs.239720	N79354	ESTs; Weakly similar to Rga [D.melanogas	3.1
105322	Hs.16346	AA234100	ESTs	3.1
100631	Hs.48332	HG2709-HT2805	Serine/Threonine Kinase (Gb:Z25431)	3.1
130791	Hs.199263	AA259102	ESTs; Highly similar to (define not ava	3.1
131220	Hs.300855	R77200	ESTs	3.1
113237	Hs.123642	T62857	ESTs	3.1
125562	Hs.98968	AI494372	ESTs	3.1
134110	Hs.79136	U41060	Human breast cancer; estrogen regulated	3.1
132393	Hs.47334	W85888	ESTs; Moderately similar to !!!! ALU SUB	3.1
107439	Hs.296842	W27995	ESTs; Moderately similar to non-muscle m	3.1
125863	Hs.40719	AA299096	Homo sapiens mRNA; cDNA DKFZp564M0916 (f	3.1
105811	Hs.286192	AA394121	ESTs	3.1
129284	Hs.296141	AA104023	ESTs	3.1
125321	Hs.178294	T86652	ESTs	3.1
107332	Hs.183297	T87750	ESTs	3.1
123570	Hs.109653	AA608955	ESTs	3.1
100384	Hs.90800	D83646	matrix metalloproteinase 16 (membrane-in	3.1
109063	Hs.38972	AA161043	tetraspan 1	3.1
133284	Hs.182828	U09367	zinc finger protein 136 (clone pHZ-20)	3.1
131839	Hs.33010	H80622	Homo sapiens mRNA for KIAA0633 protein;	3.1
117606	Hs.44698	N35115	ESTs	3.1
418998	Hs.287849	F13215	ESTs	3.1
125180	Hs.103120	W58344	ESTs	3.1
100789		HG3893-HT4163	Phosphoglucomutase 1, Alt. Splice	3.1
126017	Hs.159440	H60487	ESTs	3.1
132452	Hs.247324	AA005262	Homo sapiens DNA sequence from PAC 262D1	3.1
129077	Hs.108479	H78886	ESTs	3.1
126563	Hs.181368	W26247	U5 snRNP-specific protein (220 kD); orth	3.1
129650	Hs.118258	N52554	ESTs	3.1
123465		AA599033	ESTs	3.1
126486	Hs.152316	AA345339	EST51345 Gall bladder II Homo sapiens cD	3.1
126460	Hs.167031	W01616	za36d05.r1 Soares fetal liver spleen 1NF	3.1
118697	Hs.43234	N72094	ESTs	3.1
103860	Hs.38057	AA203742	ESTs	3.1
127968	Hs.124347	AA971439	ESTs	3.1
124984	Hs.223241	T47566	yb15c11.s1 Stratagene placenta (#937225)	3.1
103903	Hs.15220	AA249334	j312.seq.F Human fetal heart, Lambda ZAP	3.1
106697	Hs.22242	AA463737	ESTs	3.1
130892	Hs.20993	AA442604	ESTs; Weakly similar to Ydr374cp [S.cere	3
114032	Hs.35014	W92779	ESTs	3
128835	Hs.106390	W15528	ESTs	3
103667	Hs.247815	Z80788	H.sapiens H4/I gene	3
126264	Hs.250614	N42897	yy13h06.r1 Soares melanocyte 2NbHM Homo	3
132626	Hs.21275	D25755	ESTs	3
131107	Hs.75354	N87590	ESTs	3
126780	Hs.6811	R12421	ESTs	3
127363	Hs.22116	AA307744	Homo sapiens Cdc14B1 phosphatase mRNA; c	3
103690	Hs.84063	AA016186	ESTs	3
102589	Hs.8867	U62015	Homo sapiens Cyr61 mRNA, complete cds	3
125144	Hs.24336	W37999	ESTs	3
132977	Hs.301404	U28686	RNA binding motif protein 3	3
120714	Hs.146170	AA292689	ESTs	3
101038	Hs.79411	J05249	replication protein A2 (32kD)	3
102856	Hs.248177	X00090	Human histone H3 gene	3
105516	Hs.30738	AA257971	ESTs	3
131137	Hs.33287	U85193	nuclear factor I/B	3

127221	Hs.241551	AI354332	ESTs	3
411888	Hs.24104	R26708	ESTs	3
131684	Hs.3066	U26174	granzyme K (serine protease; granzyme 3;	3
100629	Hs.21291	HG2706-HT2802	Serine/Threonine Kinase (Gb:Z25428)	3
119944	Hs.58915	W86838	EST	3
113801	Hs.118281	W38418	zinc finger protein 266	3
133780	Hs.76152	M14219	decorin	3
104690	Hs.14449	AA010889	ESTs	3
126371	Hs.304139	N57645	EST	3
127635	Hs.116346	AA766903	ESTs	3
128434	Hs.143880	AI190914	ESTs	3
435761	Hs.187555	AA701941	ESTs	3
125025	Hs.50748	T71561	ESTs	3
124940	Hs.103804	R99599	heterogeneous nuclear ribonucleoprotein	3
128742	Hs.251531	D00763	proteasome (prosome; macropain) subunit;	3
107147	Hs.10450	AA621125	Homo sapiens chromosome 2; 10 repeat reg	3
112068	Hs.22545	R43910	ESTs	3
105346	Hs.263727	AA235465	ESTs; Moderately similar to !!!! ALU SUB	3
130972	Hs.21739	AA370302	Homo sapiens mRNA; cDNA DKFZp586I1518 (f	3
131230	Hs.274407	AA149987	thymus specific serine peptidase	3
133743	Hs.75847	N79435	ESTs	3
127402	Hs.227949	AA358869	ESTs; Highly similar to SEC13-RELATED PR	3
117483	Hs.44189	N30426	ESTs	3
123659	Hs.112699	AA609368	ESTs	3
103963	Hs.63290	AA298588	EST114219 HSC172 cells II Homo sapiens c	3
103795	Hs.7367	AA112222	ESTs; Moderately similar to (define not	3
115092	Hs.80975	AA255903	CD39-like 4	2.9
134831	Hs.89890	S72370	pyruvate carboxylase	2.9
128579	Hs.101810	AA093378	ESTs; Weakly similar to !!!! ALU SUBFAMI	2.9
134193	Hs.7980	F09570	ESTs	2.9
123522	Hs.112575	AA608577	ESTs	2.9
107109	Hs.32793	AA609943	ESTs	2.9
134694	Hs.88556	D50405	histone deacetylase 1	2.9
134399	Hs.82689	H99801	tumor rejection antigen (gp96) 1	2.9
134632	Hs.174139	AA398710	H. sapiens RNA for CLCN3	2.9
106683	Hs.14512	AA461495	ESTs	2.9
108555		AA084963	zn13e12.s1 Stratagene hNT neuron (#93723	2.9
100953	Hs.2110	HG945-HT945	Nucleic Acid-Binding Protein (Gb:L12693)	2.9
130597	Hs.16492	AA173998	ESTs; Weakly similar to weakly similar t	2.9
101813	Hs.139226	M87338	replication factor C (activator 1) 2 (40	2.9
106636	Hs.286	AA459950	ESTs	2.9
129109	Hs.108708	AA491295	calcium/calmodulin-dependent protein kin	2.9
125819	Hs.251871	AA044840	stromal cell-derived factor 1	2.9
106282	Hs.9857	AA433946	ESTs; Weakly similar to (define not ava	2.9
100386	Hs.301636	D83703	peroxisomal biogenesis factor 6	2.9
114546	Hs.98074	AA056263	ESTs; Moderately similar to !!!! ALU SUB	2.9
105914	Hs.9701	AA402224	Homo sapiens growth arrest and DNA-damag	2.9
108552		AA084912	zn11c7.s1 Stratagene hNT neuron (#937233	2.9
126505	Hs.190057	W26894	16a11 Human retina cDNA randomly primed	2.9
134098	Hs.79086	X06323	Human MRL3 mRNA for ribosomal protein L3	2.9
129721	Hs.211539	L19161	eukaryotic translation initiation factor	2.9
100076	Hs.277422	AB000897	Homo sapiens mRNA for cadherin FIB3, par	2.9
117466	Hs.44104	N29862	ESTs	2.9
106335	Hs.36688	AA437258	ESTs; Moderately similar to WAP four-dis	2.9
134510	Hs.250870	U25265	protein kinase; mitogen-activated; kinas	2.9
105835	Hs.32995	AA398412	ESTs	2.9
106611	Hs.26267	AA458904	ESTs; Weakly similar to torsinA [H.sapie	2.9
134087	Hs.173824	U51166	thymine-DNA glycosylase	2.9
100641	Hs.182183	HG2743-HT2846	Caldesmon 1, Alt. Splice 4, Non-Muscle	2.9
104602		R86920	ESTs	2.9
117203	Hs.42738	H99799	ESTs	2.9
131889	Hs.34073	AA401912	BH-protocadherin (brain-heart)	2.9
101707	Hs.155212	M65131	methylmalonyl Coenzyme A mutase	2.9
115271	Hs.5724	AA279422	ESTs	2.9
125812	Hs.287912	H73420	lectin; mannose-binding; 1	2.9
110740	Hs.19762	H99675	ESTs	2.9
103406	Hs.285728	X95677	H.sapiens mRNA for ArgBPIB protein	2.9
104577	Hs.132390	R71539	ESTs	2.9
102772	Hs.181002	U83115	absent in melanoma 1	2.9

131710	Hs.30985	AA233225	ESTs; Highly similar to (defline not ava	2.9
125231	Hs.268903	W84714	ESTs	2.9
127380	Hs.15535	AI417137	Homo sapiens clone 24582 mRNA sequence	2.9
104229	Hs.61289	AB002346	inositol phosphate 5'-phosphatase 2 (syn	2.9
126600	Hs.191385	AA699949	ESTs	2.9
125175	Hs.303030	W52355	EST	2.9
103849	Hs.34578	AA187045	ESTs; Weakly similar to !!!! ALU SUBFAMI	2.9
102126	Hs.78961	U14575	protein phosphatase 1; regulatory (inhib	2.9
124906	Hs.107815	R87647	ESTs	2.9
131148	Hs.303125	C00038	ESTs	2.9
123158	Hs.218329	AA488658	heat shock 70kD protein 1	2.9
133667	Hs.75462	U72649	Human BTG2 (BTG2) mRNA; complete cds	2.9
105182	Hs.18271	AA191014	ESTs; Weakly similar to Ydr372cp [S.cere	2.9
133968	Hs.232068	D15050	Human mRNA for transcription factor AREB	2.9
117425	Hs.336901	N27154	ESTs	2.9
111087	Hs.37637	N59645	ESTs	2.9
129641	Hs.11805	N66066	ESTs	2.9
128639	Hs.102897	N91246	ESTs	2.9
133209	Hs.79265	AA114183	ESTs; Moderately similar to glutamate py	2.9
135154	Hs.267812	AA126433	sorting nexin 4	2.9
126838	Hs.279609	AA858097	pigment epithelium-derived factor	2.9
103803	Hs.108149	AA127698	ESTs	2.9
102139	Hs.2128	U15932	dual specificity phosphatase 5	2.9
128104		AA971000	op67g11.s1 Soares_NFL_T_GBC_S1 Homo sapi	2.8
127834	Hs.337631	AA761415	nz22d08.s1 NCI_CGAP_GCB1 Homo sapiens cD	2.8
133101	Hs.180952	AA488230	ESTs	2.8
127250	Hs.217916	AI023717	ESTs	2.8
135063	Hs.93883	D10537	myelin protein zero (Charcot-Marie-Tooth	2.8
126323	Hs.68644	N45014	yy80g06.r1 Soares_multiple_sclerosis_2Nb	2.8
121873	Hs.145696	AA426270	ESTs	2.8
122090	Hs.98684	AA432141	ESTs	2.8
118728	Hs.322645	N73705	ESTs	2.8
135400	Hs.99915	M23263	androgen receptor (dihydrotestosterone r	2.8
125278	Hs.129998	W93523	ESTs	2.8
124387	Hs.109019	N27637	ESTs	2.8
124803	Hs.12186	R45480	cyclin K	2.8
H45968	Hs.32149	H45968	ESTs	2.8
104261	Hs.5409	AF008442	RNA polymerase I subunit	2.8
105366	Hs.282093	AA236356	ESTs	2.8
106070	Hs.5957	AA417761	Homo sapiens clone 24416 mRNA sequence	2.8
131356	Hs.25960	M13241	v-myc avian myelocytomatosis viral relat	2.8
112009	Hs.26255	R42714	EST	2.8
133199	Hs.250175	AA609773	Homo sapiens clone 23904 mRNA sequence	2.8
110379	Hs.33130	H44825	ESTs	2.8
103890	Hs.72085	AA236843	ESTs; Weakly similar to unknown [S.cerev	2.8
128152		R20353	yg20f10.r1 Soares infant brain 1NIB Homo	2.8
107008	Hs.23740	AA598710	ESTs	2.8
135243	Hs.97101	AA215333	ESTs	2.8
103058	Hs.184510	X57348	stratifin	2.8
132020	Hs.293845	AA428990	ESTs	2.8
116354	Hs.292566	AA504262	ESTs	2.8
125867	Hs.12372	H98141	ESTs	2.8
120603	Hs.98541	AA282787	ESTs; Highly similar to (defline not ava	2.8
115119	Hs.46847	AA256524	Human DNA sequence from clone 30M3 on ch	2.8
133865	Hs.170290	F09315	discs; large (Drosophila) homolog 5	2.8
109415	Hs.110826	AA227219	Homo sapiens CAGF9 mRNA; partial cds	2.8
128687	Hs.23767	Z38910	ESTs	2.8
109984	Hs.10299	H09594	ESTs; Moderately similar to !!!! ALU SUB	2.8
133179	Hs.66731	U81599	homeo box B13	2.8
115998	Hs.336829	AA448488	ESTs; Weakly similar to zinc finger prot	2.8
112180	Hs.25067	R49116	EST	2.8
120428	Hs.173694	AA236822	ESTs; Moderately similar to (defline not	2.8
106241	Hs.6019	AA430108	ESTs	2.8
131060	Hs.22564	AA160890	myosin VI	2.8
111383	Hs.40919	N94527	ESTs	2.8
102123	Hs.1594	U14518	centromere protein A (17kD)	2.8
102722	Hs.79981	U79242	Human clone 23560 mRNA sequence	2.8
129887	Hs.274324	W92041	PCAF associated factor 65 alpha	2.8
126663	Hs.181297	AA714635	ESTs	2.8

104367	Hs.134342	H17438	ESTs; Weakly similar to seventransmembra	2.8
107316	Hs.193700	T63174	ESTs; Moderately similar to !!!! ALU SUB	2.8
128059	Hs.145096	AA972446	ESTs	2.8
124447		N48000	ESTs	2.8
111398	Hs.125565	R00086	deafness; X-linked 1; progressive	2.8
134085	Hs.79018	U20979	chromatin assembly factor I (150 kDa)	2.8
124788	Hs.100912	R43543	ESTs	2.8
112248	Hs.326416	R51361	ESTs	2.8
121309	Hs.97312	AA402482	ESTs	2.8
103076	Hs.75319	X59618	ribonucleotide reductase M2 polypeptide	2.8
107071	Hs.35198	AA609053	ESTs	2.8
104425	Hs.35380	H88498	ESTs	2.8
132991	Hs.62245	AA446906	solute carrier family 25 (mitochondrial	2.8
104968	Hs.29669	AA084602	ESTs	2.8
121153	Hs.97694	AA399640	ESTs	2.8
131216	Hs.243901	D31058	ESTs	2.8
109682	Hs.22869	F09299	ESTs	2.8
131990	Hs.168818	H77734	ESTs; Moderately similar to roundabout 1	2.8
132027	Hs.181444	N78844	ESTs; Weakly similar to R12C12.6 [C.eleg	2.8
127383	Hs.190478	AA447990	ESTs	2.8
132598	Hs.530	M81379	collagen; type IV; alpha 3 (Goodpasture	2.8
101121	Hs.1313	L09753	tumor necrosis factor (ligand) superfami	2.8
123000	Hs.105640	AA479347	ESTs	2.8
121329	Hs.1755	AA404324	ESTs	2.8
100481	Hs.121489	HG1098-HT1098	Cystatin D	2.7
113803	Hs.283683	W42789	ESTs	2.7
110934	Hs.169001	N48708	ESTs; Weakly similar to cytochrome P-450	2.7
432888		T86823	ESTs	2.7
121802	Hs.188898	AA424328	ESTs	2.7
130396	Hs.155313	AB002331	Human mRNA for KIAA0333 gene; partial cd	2.7
121103	Hs.97697	AA398936	ESTs; Weakly similar to (define not ava	2.7
131129	Hs.23240	R27296	ESTs	2.7
130943	Hs.272429	D50855	calcium-sensing receptor (hypocalciuric	2.7
134676	Hs.87819	W28051	ESTs; Weakly similar to keratin 9; cytos	2.7
111900	Hs.25318	R39044	ESTs	2.7
106025	Hs.173334	AA412063	ESTs	2.7
126144	Hs.40639	N39696	yx92a07.r1 Soares melanocyte 2NbHM Homo	2.7
103248	Hs.75262	X77383	cathepsin O	2.7
127230	Hs.274170	H30501	Homo sapiens Opa-interacting protein OIP	2.7
101584	Hs.84072	M35252	transmembrane 4 superfamily member 3	2.7
124131	Hs.167489	H19980	ESTs	2.7
129689	Hs.77873	AA130156	ESTs	2.7
132892	Hs.9973	W92797	ESTs	2.7
120827	Hs.132967	AA347717	ESTs	2.7
134579	Hs.85963	N23222	ESTs; Moderately similar to !!!! ALU SUB	2.7
106149	Hs.256301	AA424881	ESTs	2.7
132037	Hs.332541	AA203649	ESTs; Weakly similar to HEM45 [H.sapiens	2.7
130542	Hs.179825	U64675	Human sperm membrane protein BS-63 mRNA,	2.7
122851	Hs.99598	AA463627	ESTs	2.7
134983	Hs.196384	D28235	prostaglandin-endoperoxide synthase 2 (p	2.7
120537	Hs.160422	AA262790	ESTs	2.7
131036	Hs.174140	X64330	ATP citrate lyase	2.7
133889	Hs.211582	AA099391	ESTs	2.7
128847	Hs.106529	AA424199	zv81e01.r1 Soares_total_fetus_Nb2HF8_9w	2.7
112755	Hs.306044	R93802	ESTs	2.7
423239		AA323591	EST26392 Cerebellum II Homo sapiens cDNA	2.7
105031	Hs.12321	AA127240	ESTs	2.7
126021	Hs.187516	AA775894	ESTs	2.7
102116		U13706	Human ELAV-like neuronal protein 1 isofo	2.7
133394	Hs.237225	R16759	ESTs; Weakly similar to (define not ava	2.7
104267	Hs.278439	C00358	ESTs	2.7
107614	Hs.40241	AA004878	ESTs; Highly similar to (define not ava	2.7
129809	Hs.1259	X55283	asialoglycoprotein receptor 2	2.7
112109	Hs.283309	R45221	ESTs; Weakly similar to !!!! ALU SUBFAMI	2.7
128422		T85681	yd60c06.r1 Soares fetal liver spleen 1NF	2.7
109494	Hs.43899	AA233702	ESTs	2.7
118696	Hs.292284	N72086	Homo sapiens RNA polymerase III largest	2.7
106053	Hs.36727	AA416963	ESTs; Highly similar to histone H2A [H.s	2.7
104440	Hs.284380	L20492	gamma-glutamyltransferase 1	2.7

129426	Hs.111323	AA412087	EST; Highly similar to (defline not aval	2.7
123798		AA620411	small inducible cytokine A5 (RANTES)	2.7
106716	Hs.238928	AA464962	ESTs	2.7
103663		Z78291	Z78291 Homo sapiens brain fetus Homo sap	2.7
114162	Hs.22265	Z38909	ESTs	2.7
113063	Hs.5027	T32438	ESTs	2.7
127697		AA773857	af80c09.r1 Soares_NhHMPu_S1 Homo sapiens	2.7
130621	Hs.16803	AA621718	ESTs; Weakly similar to (defline not ava	2.7
116245	Hs.42796	AA479958	ESTs; Highly similar to (defline not ava	2.7
125499		R11878	yf49d11.r1 Soares infant brain 1NIB Homo	2.7
133960	Hs.77899	M19267	tropomyosin 1 (alpha)	2.7
104470	Hs.246358	N28843	ESTs; Weakly similar to Similar to colla	2.7
134982	Hs.92308	N48086	ESTs	2.7
106803	Hs.284295	AA479114	ESTs	2.7
104899	Hs.285574	AA054726	ESTs	2.7
125401	Hs.337585	AI204637	ESTs; Moderately similar to KIAA0350 [H.	2.7
111253	Hs.15768	N70042	ESTs; Moderately similar to !!!! ALU SUB	2.7
118449	Hs.164478	N66413	ESTs; Weakly similar to (defline not ava	2.7
134507	Hs.84318	M63488	replication protein A1 (70kD)	2.7
121609	Hs.98185	AA416867	EST	2.7
113835	Hs.27475	W56590	ESTs	2.7
113962	Hs.285290	W86375	ESTs; Highly similar to (defline not ava	2.7
121913	Hs.98558	AA428062	ESTs	2.7
108194	Hs.216717	AA057250	ESTs	2.7
130799	Hs.12696	AA464273	ESTs	2.7
123184	Hs.18166	AA489072	Homo sapiens mRNA for KIAA0870 protein;	2.7
103420	Hs.173497	X97065	SEC23-like protein B	2.7
106186	Hs.6315	AA427398	acetylserotonin N-methyltransferase-like	2.7
101349		L77559	Homo sapiens DGS-B partial mRNA	2.7
112954	Hs.6655	T16559	ESTs	2.7
133054	Hs.291079	R07876	ESTs; Weakly similar to unknown [S.cerev	2.7
128131	Hs.25640	AI283162	claudin 3	2.6
101864	Hs.75777	M95787	transgelin	2.6
111948	Hs.26303	R40752	ESTs	2.6
130145	Hs.151051	U07620	protein kinase mitogen-activated 10 (MAP	2.6
126507	Hs.23964	AI362218	ESTs	2.6
117903	Hs.47111	N50740	ESTs	2.6
116345	Hs.199067	AA496981	ESTs	2.6
132227	Hs.4248	AA412620	ESTs	2.6
125746	Hs.274256	H03574	yj42b06.r1 Soares placenta Nb2HP Homo sa	2.6
105073	Hs.89463	AA137034	ESTs	2.6
102764		U82310	Homo sapiens unknown protein mRNA, parti	2.6
131367	Hs.173933	AA456687	ESTs	2.6
130792	Hs.19500	AA307896	nuclear localization signal deleted in v	2.6
107427	Hs.46736	W26975	ESTs	2.6
117477	Hs.44175	N30328	ESTs	2.6
106290	Hs.16364	AA435542	ESTs	2.6
126829	Hs.7910	R11547	ESTs	2.6
118836	Hs.173001	N79820	ESTs	2.6
100147	Hs.136348	D13666	osteoblast specific factor 2 (fasciclin	2.6
104278	Hs.109253	C02582	ESTs; Highly similar to (defline not ava	2.6
135051	Hs.83484	C15324	ESTs	2.6
126081	Hs.227835	AI346024	collagen; type I; alpha 1	2.6
123579		AA608983	af5d4.s1 Soares_testis_NHT Homo sapiens	2.6
130115	Hs.149923	M31627	X-box binding protein 1	2.6
101434	Hs.1430	M20218	coagulation factor XI (plasma thrombopla	2.6
122962	Hs.104720	AA478429	ESTs; Moderately similar to !!!! ALU SUB	2.6
126151	Hs.40808	AA324743	ESTs	2.6
128925	Hs.21851	D61676	Homo sapiens mRNA; cDNA DKFZp586J2118 (f	2.6
128919	Hs.103391	L27559	insulin-like growth factor binding prote	2.6
130296	Hs.154103	R09286	LIM protein (similar to rat protein kina	2.6
128402	Hs.191637	AA457244	ESTs	2.6
129273	Hs.109968	W63783	ESTs	2.6
125483	Hs.7788	F07759	ESTs	2.6
132953	Hs.321264	AA029927	ESTs	2.6
130963	Hs.21639	U57099	nuclear protein; marker for differentiat	2.6
120614	Hs.194154	AA284281	ESTs; Weakly similar to !!!! ALU SUBFAMI	2.6
123251	Hs.103267	AA490858	ESTs; Moderately similar to Rabin3 [R.no	2.6
121710	Hs.96744	AA419011	ESTs	2.6

125428	Hs.851	W74608	ESTs; Highly similar to (define not ava	2.6
115906	Hs.82302	AA436616	ESTs	2.6
108432		AA076626	Homo sapiens clone 23851 mRNA sequence	2.6
126191	Hs.191911	H97728	ESTs	2.6
106164	Hs.281434	AA425773	ESTs	2.6
111519	Hs.268615	R08165	ESTs	2.6
134590	Hs.173840	W58612	ESTs	2.6
102565		U59748	Human desert hedgehog (hDHH) mRNA, parti	2.6
129879	Hs.13109	AA194973	ESTs	2.6
114264	Hs.334609	Z40074	ESTs	2.6
106236	Hs.21104	AA429851	ESTs	2.6
135192	Hs.321709	AF000234	purinergic receptor P2X; ligand-gated io	2.6
109833	Hs.29889	H00580	ESTs	2.6
105756	Hs.8535	AA303088	ESTs; Weakly similar to transformation-r	2.6
121422	Hs.97967	AA406210	ESTs	2.6
130417	Hs.155485	U58522	Human huntingtin interacting protein (HI	2.6
124312	Hs.102329	H94647	ESTs	2.6
108998	Hs.97199	AA156058	ESTs	2.6
127081	Hs.180591	R88382	ESTs; Weakly similar to weak similarity	2.6
129574	Hs.11463	AA458603	ESTs; Weakly similar to (define not ava	2.6
112410	Hs.26904	R61680	ESTs	2.6
123929	Hs.112981	AA621364	ESTs	2.6
122905	Hs.104835	AA470070	ESTs	2.6
116399	Hs.110637	AA599729	Homo sapiens homeobox protein A10 (HOXA1	2.6
130279	Hs.153934	AA424044	core-binding factor; runt domain; alpha	2.6
130021	Hs.1435	M24470	guanosine monophosphate reductase	2.6
100585	Hs.199160	HG2367-HT2463	Trithorax Homolog Hrx	2.6
104965	Hs.30177	AA084104	ESTs	2.6
117711	Hs.46485	N45201	EST	2.6
124792	Hs.48712	R44357	ESTs	2.6
111299	Hs.74313	N73808	ESTs	2.6
103616	Hs.32971	Z46973	phosphoinositide-3-kinase; class 3	2.6
133629	Hs.195614	D13642	KIAA0017 gene product	2.6
126484	Hs.169977	AI086782	ESTs	2.6
100858		HG4245-HT4515	Forkhead Family Afx1	2.6
133547	Hs.301927	X02883	T-cell receptor; alpha (V;D;J;C)	2.6
126680	Hs.133865	F07097	ESTs	2.6
125739	Hs.92137	AA428557	v-myc avian myelocytomatosis viral oncog	2.6
102276	Hs.10247	U30999	Human (memc) mRNA, 3'UTR	2.6
105586	Hs.191538	AA279137	ESTs	2.6
103978	Hs.34136	AA307443	ESTs	2.6
125054	Hs.268601	T80622	ESTs; Weakly similar to (define not ava	2.6
114212	Hs.21201	Z39338	ESTs; Highly similar to (define not ava	2.6
116959	Hs.40022	H79310	EST	2.6
109228	Hs.306995	AA193366	ESTs	2.6
133989	Hs.78202	U29175	SWI/SNF related; matrix associated; acti	2.6
100640	Hs.182183	HG2743-HT2845	Caldesmon 1, Alt. Splice 3, Non-Muscle	2.6
133093	Hs.285996	AA598749	ESTs	2.6
114306	Hs.6540	Z40861	ESTs	2.6
106060	Hs.171391	AA417287	C-terminal binding protein 2	2.5
107748	Hs.60772	AA017258	EST	2.5
100134	Hs.49	D13264	macrophage scavenger receptor 1	2.5
133969	Hs.78	U13044	GA-binding protein transcription factor;	2.5
130992	Hs.74316	AA455001	ESTs	2.5
127493	Hs.291701	AA808081	oc39a08.s1 NCI_CGAP_GCB1 Homo sapiens cD	2.5
132869	Hs.203961	N26855	ESTs	2.5
117570	Hs.44583	N34415	EST	2.5
124644	Hs.109654	N91279	ESTs	2.5
103558	Hs.2785	Z19574	keratin 17	2.5
132883	Hs.5897	AA047151	ESTs	2.5
102009	Hs.82643	U02680	protein tyrosine kinase 9	2.5
116058	Hs.20159	AA454156	ESTs	2.5
121989	Hs.193784	AA430044	ESTs	2.5
131257	Hs.24908	AA256042	ESTs	2.5
100320	Hs.75275	D50916	homolog of yeast (S. cerevisiae) ufd2	2.5
102959	Hs.121524	X15722	glutathione reductase	2.5
132969	Hs.6166	AA047616	ESTs	2.5
130869	Hs.2057	AA128100	uridine monophosphate synthetase (orotat	2.5
129645	Hs.118131	L38928	5;10-methenyltetrahydrofolate synthetase	2.5

126399	Hs.83883	AA128075	zl16d08.r1 Soares_pregnant_uterus_NbHPU	2.5
134069	Hs.78935	U29607	Homo sapiens eIF-2-associated p67 homolo	2.5
109816	Hs.61960	F11013	ESTs; Weakly similar to KIAA0176 [H.sapi	2.5
134801	Hs.89695	X02160	insulin receptor	2.5
104232	Hs.10587	AB002351	Human mRNA for KIAA0353 gene; partial cd	2.5
107381	Hs.159486	U72513	Human RPL13-2 pseudogene mRNA; complete	2.5
106057	Hs.289074	AA417067	ESTs	2.5
134252	Hs.80720	AA031782	Homo sapiens mRNA; cDNA DKFZp586B1722 (f	2.5
128062	Hs.105547	AA379500	ESTs	2.5
110009	Hs.6614	H10933	ESTs	2.5
111375	Hs.20432	N93696	ESTs	2.5
122642	Hs.99361	AA454186	ESTs	2.5
127999	Hs.69851	AA837495	ESTs; Weakly similar to Wiskott-Aldrich	2.5
105029	Hs.13268	AA126855	ESTs	2.5
105082	Hs.26765	AA143763	ESTs; Weakly similar to Similarity to S.	2.5

TABLE 1A show the accession numbers for those primekeys lacking unigeneID's for Table 1. For each probeset we have listed the gene cluster number from which the oligonucleotides were designed. Gene clusters were compiled using sequences derived from Genbank ESTs and mRNAs. These sequences were clustered based on sequence similarity using Clustering and Alignment Tools (DoubleTwist, Oakland California). The Genbank accession numbers for sequences comprising each cluster are listed in the "Accession" column.

Pkey: Unique Eos probeset identifier number
CAT number: Gene cluster number
Accession: Genbank accession numbers

Pkey	CAT number	Accessions
108552	111555_1	AA071210 AA069899 AA071438 AA084912 AA084803 AA079371 AA079370
126023	1596090_1	H57661 H58881
126086	1606216_1	H75681 H70975
102565	32479_1	AB010994 U59748 AA064660
101964	48158_-7	S81578
125499	1562851_1	H10543 R11878
125596	1708455_1	R25698 R56582 R56018
118417	37186_1	AF080229 AF080231 AF080230 AF080232 AF080233 AF080234 BE550833 AI636743 AW614951 BE467547 AI680833 AI633818 N29986 U87592 U87593 U87590 U87591 S46404 U87587 AA463992 AW206802 AI970376 AI583718 AI672574 N25695 AW665466 AI818326 AA126128 AI480345 AW013827 AA248638 AI214968 AA204735 AA207155 AA206262 AA204833 AW003247 AW496808 AI080480 AI631703 AI651023 AI867418 AW818140 AA502500 AI206199 AI671282 AI352545 BE501030 AI652535 BE465762 AA206331 AW451866 AA471088 AA206342 AA204834 AA206100 AW021661 AA332922 N66048 AA703396 H92278 AW139734 H92683 U87589 U87595 H69001 U87594 BE466420 AI624817 BE466611 AI206344 AA574397 AA348354 AI493192
125661	327827_1	AA491830 R50173 R55192 R50320 AI732306 AI732305 AI820727 AI820728 R55191 R50319 R50227
125957	1583542_1	H41694 H45213
125982	1766315_1	R98091 W92898
127248	227560_1	AA364195 AA325029 AW862050
103731	112052_1	AA070545 AA131490 AA131373
127261	231687_1	AA330501 AA661567
127265	232391_1	AA331503 AA332751 AW962542
126659	1541209_1	T16245 R19694 F13545 H10299 T66048 T65279 H18006
127315	37938_1	AF116622 AI114507 AA640834 AA377999
103806	112618_1	AA130614 AA071410
128104	502608_1	AA906093 AA971000
104602	524482_2	H47610 R86920
128152	297868_1	F07973 R20353 AA442660
128422	1811283_1	T77794 T85681
127897	446527_1	AA773681 AA773857
106566	120358_1	BE298210 AI672315 AW086489 BE298417 AA455921 AA902537 BE327124 R14963 AA085210 AW274273 AI333584 AI369742 AI039658 AI885095 AI476470 AI287650 AI885299 AI985381 AW592624 AW340136 AI266556 AA456390 AI310815 AA484951
129735	44573_2	AI950087 N70208 R97040 N36809 AI308119 AW967677 N35320 AI251473 H59397 AW971573 R97278 W01059 AW967671 AA908598 AA251875 AI820501 AI820532 W87891 T85904 U71456 T82391 BE328571 T75102 R34725 AA884922 BE328517 AI219788 AA884444 N92578 F13493 AA927794 AI560251 AW874068 AL134043 AW235363 AA663345 AW008282 AA488964 AA283144 AI890387 AI950344 AI741346 AI689062 AA282915 AW102898 AI872193 AI763273 AW173586 AW150329 AI653832 AI762688 AA988777 AA488892 AI356394 AW103813 AI539642 AA642789 AA856975 AW505512 AI961530 AW629970 BE612881 AW276997 AW513601 AW512843 AA044209 AW856538 AA180009 AA337499 AW961101 AA251669 AA251874 AI819225 AW205862 AI683338 AI858509 AW276905 AI633006 AA972584 AA908741 AW072629 AW513996 AA293273 AA969759 N75628 N22388 H84729 H60052 T92487 AI022058 AA780419 AA551005 W80701 AW613456 AI373032 AI564269 F00531 H83488 W37181 W78802 R66056 AI002839 R67840 AA300207 AW959581 T63226 F04005
123147	219802_-2	AA487961
130529	158447_1	AA178953 AA192740
123579	genbank_AA608983	AA608983
109175	genbank_AA180496	AA180496
100789	tigr_HT4163	S67998
100858	tigr_HT4515	U10072

123798	579959_1	AA620411 AA287491
102116	entrez_U13706	U13706
102398	entrez_U42359	U42359
102764	entrez_U82310	U82310
118475	genbank_N66845	N66845
104776	genbank_AA026349	AA026349
104787	genbank_AA027317	AA027317
113702	genbank_T97307	T97307
113938	genbank_W81598	W81598
122635	genbank_AA454085	AA454085
108407	genbank_AA075519	AA075519
108432	genbank_AA076626	AA076626
108555	genbank_AA084963	AA084963
101349	entrez_L77559	L77559
124447	genbank_N48000	N48000
119071	genbank_R31180	R31180
103520	entrez_Y10511	Y10511
103663	genbank_Z78291	Z78291
128046	877605_1	AA873285 AI025762
126959	546044_1	AA199853 AA206355
123465	genbank_AA599033	AA599033

MISSING AT THE TIME OF PUBLICATION

TABLE 2: shows a preferred subset of the Accession numbers for genes found in Table 1 which are differentially expressed in prostate tumor tissue compared to normal prostate tissue.

Pkey: Unique Eos probeset identifier number
ExAccn: Exemplar Accession number, Genbank accession number
UnigeneID: Unigene number
Unigene Title: Unigene gene title
R1: Ratio of tumor to normal body tissue (Relaxed ratio (87/70)

Pkey	ExAccn	UnigeneID	Unigene Title	R1
131919	AA121266	Hs.272458	ESTs	37.2
120328	AA196979	Hs.290905	ESTs; Weakly similar to (define not ava	32.6
101486	M24902	Hs.1852	acid phosphatase; prostate	25.2
119073	R32894	Hs.279477	ESTs	24.8
133428	M34376	Hs.183752	microseminoprotein; beta-	23.8
128180	AA595348	Hs.171995	kallikrein 3; (prostate specific antigen	21.4
104080	AA402971	Hs.57771	Homo sapiens mRNA for serine protease (T	18.9
127537	AA569531	Hs.162859	ESTs	18.6
131665	R22139	Hs.30343	ESTs	17.4
101050	K01911	Hs.1832	neuropeptide Y	17.3
130771	N48056	Hs.1915	folate hydrolase (prostate-specific memb	17
107485	W63793	Hs.262476	S-adenosylmethionine decarboxylase 1	16.7
106155	AA425309	Hs.33287	ESTs	16.5
129534	R73640	Hs.11260	ESTs	16.4
100569	HG2261-HT2351		Antigen, Prostate Specific, Alt. Splice	16
101889	S39329	Hs.181350	kallikrein 2; prostatic	15.4
135389	U05237	Hs.99872	fetal Alzheimer antigen	15
133944	AA045870	Hs.7780	ESTs	12.5
130974	X57985	Hs.2178	H2B histone family; member Q	11.8
114768	AA149007	Hs.182339	ESTs	11.8
104660	AA007160	Hs.14846	ESTs	11.4
131061	N64328	Hs.268744	ESTs; Moderately similar to KIAA0273 [H.	10.9
126645	AI167942	Hs.61635	Homo sapiens BAC clone RG041D11 from 7q2	10.7
135153	N40141	Hs.95420	Homo sapiens mRNA for JM27 protein; comp	10.6
107033	AA599629	Hs.113314	ESTs	10.6
118417	N66048		ESTs; Weakly similar to polymerase [H.sa	10.5
126758	W37145	Hs.293960	ESTs	10.2
107102	AA609723	Hs.30652	ESTs	10.1
116787	H28581	Hs.15641	ESTs	10.1
115719	AA416997	Hs.59622	ESTs	10
123209	AA489711	Hs.203270	ESTs	9.9
101664	M60752	Hs.121017	H2A histone family; member A	9.8
112971	T17185	Hs.83883	ESTs	9.7
117984	N51919	Hs.106778	ESTs	9.7
129523	M30894	Hs.274509	T-cell receptor; gamma cluster	9.4
132984	AA031360	Hs.167133	ESTs	9.2
121853	AA425887	Hs.98502	ESTs	9
119617	W47380	Hs.55999	ESTs	8.9
105627	AA281245	Hs.23317	ESTs	8.8
101461	M22430	Hs.76422	phospholipase A2; group IIA (platelets;	8.7
124526	N62096	Hs.293185	yz61c5.s1 Soares_multiple_sclerosis_2NbH	8.5
133845	T68510	Hs.76704	ESTs	8.2
133354	AA055552	Hs.334762	ESTs; Weakly similar to KIAA0319 [H.sapi	8.1
119018	N95796	Hs.278695	ESTs	8
100394	D84276	Hs.66052	CD38 antigen (p45)	8
106579	AA456135	Hs.23023	ESTs	7.6
114965	AA250737	Hs.72472	ESTs	7.4
112033	R43162	Hs.22627	ESTs	7.1
102398	U42359		Human N33 protein form 1 (N33) gene, exo	7
101201	L22524	Hs.2256	matrix metalloproteinase 7 (matrilysin;	6.9
101803	M86546	Hs.155691	pre-B-cell leukemia transcription factor	6.8
120562	AA280036	Hs.302267	ESTs; Weakly similar to W01A6.c [C.elega	6.8

109112	AA169379	Hs.257924	ESTs	6.8
109795	F10707	Hs.326416	ESTs	6.7
130336	X07730	Hs.171995	kallikrein 3; (prostate specific antigen	6.6
131425	AA219134	Hs.26691	ESTs	6.6
132902	AA490969	Hs.59838	ESTs	6.6
133724	U07919	Hs.75746	aldehyde dehydrogenase 6	6.5
120215	Z41050	Hs.108787	Homo sapiens Mcd4p homolog mRNA; complet	6.5
131881	AA010163	Hs.3383	upstream regulatory element binding prot	6.5
100727	X07290	Hs.334786	Human HF.12 gene mRNA	6.3
121770	AA421714	Hs.278428	Homo sapiens mRNA for KIAA0896 protein;	6.3
123475	AA599267	Hs.250528	ESTs; Weakly similar to ANKYRIN; BRAIN V	6.3
133061	AB000584	Hs.296638	prostate differentiation factor	6.3
116429	AA609710	Hs.279923	ESTs; Weakly similar to similar to GTP-b	6.2
101233	L29008	Hs.878	sorbitol dehydrogenase	6.2
104691	AA011176	Hs.37744	ESTs	6.2
127248	AA325029		EST27953 Cerebellum II Homo sapiens cDNA	6.2
105500	AA256485	Hs.222399	ESTs	6.1
130828	AA053400	Hs.203213	ESTs	5.9
115357	AA281793	Hs.72988	ESTs	5.8
116334	AA491457	Hs.48948	ESTs	5.7
120132	Z38639	Hs.125019	ESTs; Weakly similar to !!!! ALU SUBFAMI	5.6
106375	AA443993	Hs.289072	ESTs	5.6
124777	R41933	Hs.140237	ESTs; Weakly similar to neuronal thread	5.6
101791	M83822	Hs.62354	Human beige-like protein (BGL) mRNA; par	5.5
117698	N41002	Hs.45107	ESTs	5.5
122041	AA431407	Hs.98732	Homo sapiens Chromosome 16 BAC clone CIT	5.5
133723	AA088851	Hs.262476	S-adenosylmethionine decarboxylase 1	5.5
113938	W81598		ESTs	5.4
133015	AA047036	Hs.246315	ESTs	5.4
108186	AA056482	Hs.7780	ESTs	5.3
104466	N25110	Hs.326392	Human guanine nucleotide exchange factor	5.3
104033	AA365031	Hs.98944	ESTs	5.3
110844	N31952	Hs.167531	ESTs; Weakly similar to (defline not ava	5.3
129056	H70627	Hs.108336	ESTs; Weakly similar to !!!! ALU SUBFAMI	5.3
133493	AA284143	Hs.194369	Homo sapiens chromosome 1 atrophin-1 rel	5.3
129184	W26769	Hs.109201	ESTs; Highly similar to (defline not ava	5.2
101448	M21389	Hs.195850	keratin 5 (epidermolysis bullosa simplex	5.1
116188	AA464728	Hs.184598	ESTs; Weakly similar to !!!! ALU SUBFAMI	5.1
105921	AA402613	Hs.169119	ESTs	5.1
103375	X91868	Hs.54416	sine oculis homeobox (Drosophila) homolo	5.1
128871	AA400271	Hs.106778	ESTs; Highly similar to (defline not ava	5.1
116238	AA479362	Hs.47144	ESTs	5
102913	X07696	Hs.80342	keratin 15	5
103011	X52541	Hs.326035	early growth response 1	5
118981	N93839	Hs.39288	ESTs; Weakly similar to !!!! ALU SUBFAMI	5

TABLE 2A shows the accession numbers for those primekeys lacking unigeneID's for Table 2. For each probeset we have listed the gene cluster number from which the oligonucleotides were designed. Gene clusters were compiled using sequences derived from Genbank ESTs and mRNAs. These sequences were clustered based on sequence similarity using Clustering and Alignment Tools (DoubleTwist, Oakland California). The Genbank accession numbers for sequences comprising each cluster are listed in the "Accession" column.

Pkey: Unique Eos probeset identifier number
CAT number: Gene cluster number
Accession: Genbank accession numbers

Pkey	CAT number	Accession
118417	37186_1	AF080229 AF080231 AF080230 AF080232 AF080233 AF080234 BE550633 AI636743 AW614951 BE467547 AI680833 AI633818 N29986 U87592 U87593 U87590 U87591 S46404 U87587 AA463992 AW206802 AI970376 AI583718 AI672574 N25695 AW665466 AI818326 AA126128 AI480345 AW013827 AA248638 AI214968 AA204735 AA207155 AA206262 AA204833 AW003247 AW496808 AI080480 AI631703 AI651023 AI867418 AW818140 AA502500 AI206199 AI671282 AI352545 BE501030 AI652535 BE465762 AA206331 AW451866 AA471088 AA206342 AA204834 AA206100 AW021661 AA332922 N66048 AA703398 H92278 AW139734 H92683 U87589 U87595 H69001 U87594 BE466420 AI624817 BE466611 AI206344 AA574397 AA348354 AI493192
127248	227560_1	AA364195 AA325029 AW962050
107033	235652_1	AI141999 AA730176 R44544 R41778 AW300793 AW966157 AA918501 AA599629 AI082195 AI198537 AW006520 AW236663 AW151420 AI826987 AI810832 AI669102 AI201981 N27331 AA335566 T84622 BE085347 BE085269
102398	entrez_U42359	U42359
113938	genbank_W81598	W81598

TABLE 3: shows genes, including expression sequence tags, differentially expressed in prostate tumor tissue compared to normal tissue as analyzed using the Affymetrix/Eos Hu02 GeneChip array. Shown are the relative amounts of each gene expressed in prostate tumor samples and various normal tissue samples showing the highest expression of the gene.

Pkey: Unique Eos probeset identifier number
ExAccn: Exemplar Accession number, Genbank accession number
UnigeneID: Unigene number
Unigene Title: Unigene gene title
R1: Ratio of tumor to normal body tissue

Pkey	ExAccn	UnigeneID	Unigene Title	R1
100131	D12485	Hs.11951	phosphodiesterase I/nucleotide pyrophosp	6.3
100235	D29954	Hs.13421	KIAA0056 protein	5.1
100570	HG2261-HT2352	Hs.171995	Antigen, Prostate Specific, Alt. Splice	9
100819	HG4020-HT4290	Hs.2387	Transglutaminase	10.5
101063	L00354	Hs.80247	cholecystokinin	8.5
101247	L33801	Hs.78802	glycogen synthase kinase 3 beta	4.7
101416	M17254	Hs.279477	v-ets avian erythroblastosis virus E26 o	4.7
101447	M21305		Human alpha satellite and satellite 3 ju	11
101485	M24736	Hs.89546	selectin E (endothelial adhesion molecul	9.8
101514	M28214	Hs.123072	RAB3B; member RAS oncogene family	6.2
101626	M57399	Hs.44	pleiotrophin (heparin binding growth fac	8.4
101663	M60750	Hs.2178	H2B histone family; member A	4.9
101758	M77836	Hs.79217	pyrroline-5-carboxylate reductase 1	5.4
101768	M81118	Hs.78989		7.5
101817	M88163	Hs.152292	SWI/SNF related; matrix associated; acti	5.5
101888	M99701	Hs.95243	transcription elongation factor A (SII)-	5.7
102031	U04898	Hs.2156	RAR-related orphan receptor A	13.2
102052	U07559	Hs.505	ISL1 transcription factor; LIM/homeodoma	8.9
102221	U24576	Hs.3844	LIM domain only 4	5.6
102233	U26173	Hs.79334	nuclear factor; interleukin 3 regulated	7.4
102302	U33052	Hs.69171	protein kinase C-like 2	8.2
102348	U37519	Hs.87539	aldehyde dehydrogenase 8	5.9
102457	U48807	Hs.2359	dual specificity phosphatase 4	5.1
102473	U49957	Hs.180398	LIM domain-containing preferred transloc	5.7
102669	U71207	Hs.29279	eyes absent (Drosophila) homolog 2	9
102698	U75272	Hs.1867	progastricsin (pepsinogen C)	10.6
102751	U80034	Hs.68583	mitochondrial intermediate peptidase	15.6
102823	U90914	Hs.5057	carboxypeptidase D	4.9
102869	X02544	Hs.572	orosomucoid 1	22.6
103031	X54667	Hs.123114	cystatin S	4.7
103043	X55733	Hs.93379	eukaryotic translation initiation factor	4.9
103093	X60708	Hs.44926	dipeptidylpeptidase IV (CD26; adenosine	5.8
103376	X92098	Hs.323378	coated vesicle membrane protein	5.2
103401	X95240	Hs.54431	specific granule protein (28 kDa); cyste	7.4
103613	Z46629	Hs.2316	SRY (sex-determining region Y)-box 9 (ca	5.2
103677	Z83806		H.sapiens mRNA for axonemal dynein heavy	4.9
103962	AA298180	Hs.83243	ESTs	6
104084	AA410529	Hs.30732	ESTs	6.4
104257	AF006265	Hs.9222	estrogen receptor-binding fragment-assoc	6.8
104301	D45332	Hs.6783	ESTs	10.5
104769	AA025887	Hs.293943	ESTs; Weakly similar to !!!! ALU SUBFAMI	6.3
104851	AA040882	Hs.10290	U5 snRNP-specific 40 kDa protein (hPrp8-	4.9
104896	AA054228	Hs.23165	ESTs	5.8
104956	AA074880	Hs.20509	ESTs; Weakly similar to hypothetical pro	6.4
104957	AA074919	Hs.10026	ESTs; Weakly similar to ORF YJL063c [S.c	4.8
104967	AA084506	Hs.291000	ESTs	6.5
105099	AA150776	Hs.23729	Homo sapiens clone 24405 mRNA sequence	7
105298	AA233459	Hs.28369	ESTs	5.1

105304	AA233553	Hs.190325	ESTs	4.7
105370	AA236476	Hs.22791	ESTs; Weakly similar to transmembrane pr	10.3
105427	AA251330	Hs.28248	ESTs	5
105542	AA261858	Hs.266957	ESTs; Weakly similar to heat shock prote	8.8
105628	AA281251	Hs.79828	ESTs; Weakly similar to putative zinc fi	5.5
105640	AA281623	Hs.6685	ESTs; Weakly similar to KIAA0742 protein	8
105645	AA282138	Hs.11325	ESTs	14
105691	AA287097	Hs.289068	transcription factor 4	6.3
105730	AA292701	Hs.5364	DKFZP564I052 protein	4.9
105808	AA393808	Hs.286131	KIAA0438 gene product	7
105826	AA398243	Hs.194477	ESTs; Moderately similar to similar to N	5
105903	AA401433	Hs.200016	ESTs; Weakly similar to diphosphoinosito	9.9
105906	AA401633	Hs.22380	ESTs	11.5
106065	AA417558	Hs.25206	ESTs	5.1
106094	AA419461	Hs.23317	ESTs	10.9
106157	AA425367	Hs.34892	ESTs	6.6
106184	AA426643	Hs.10762	ESTs	8.5
106211	AA428240	Hs.126083	ESTs	8.4
106213	AA428258	Hs.8769	Homo sapiens mRNA; cDNA DKFZp564E153 (fr	5.7
106272	AA432074	Hs.323099	ESTs	5.8
106369	AA443828	Hs.288856	ESTs	6.3
106400	AA447621	Hs.94109	ESTs	5.4
106474	AA450212	Hs.42484	Homo sapiens mRNA; cDNA DKFZp564C053 (fr	9.2
106507	AA452584	Hs.267819	protein phosphatase 1; regulatory (inhib	5.6
106523	AA453441	Hs.31511	ESTs	4.7
106532	AA453628	Hs.37443	ESTs	4.7
106557	AA455087	Hs.22247	ESTs	5.7
106575	AA456039	Hs.105421	ESTs	7.2
106618	AA459249	Hs.8715	ESTs; Weakly similar to Similarity with	5.6
106820	AA481037	Hs.12592	ESTs	5.4
106846	AA485223	Hs.34892	ESTs	5.3
106973	AA505141	Hs.11923	Human DNA sequence from clone 167A19 on	7.5
107110	AA609952	Hs.12784	KIAA0293 protein	6.1
107127	AA620504	Hs.179898	ESTs	7.1
107159	AA621340	Hs.10600	ESTs; Weakly similar to ORF YKR081c [S.c	5.2
107217	D51095	Hs.35861	DKFZP586E1621 protein	15.1
107365	U78294	Hs.111256	arachidonate 15-lipoxygenase; second typ	4.7
107630	AA007218	Hs.60178	ESTs	5.3
107734	AA016225	Hs.7517	ESTs	4.8
107760	AA018042	Hs.252085	EST	7.6
107997	AA037388	Hs.82223	Human DNA sequence from clone 141H5 on c	10.5
108012	AA039616	Hs.173334	ESTs	6.5
108520	AA084138	Hs.46786	ESTs	7.9
108583	AA088276	Hs.68826	ESTs	5.6
108613	AA100967	Hs.69165	ESTs	6
108664	AA113349	Hs.69588	EST	6.3
108677	AA115629	Hs.118531	ESTs	5.9
108807	AA129968	Hs.49376	ESTs; Weakly similar to PROTEIN PHOSPHAT	5.8
108910	AA136590		ESTs	5
108933	AA147224	Hs.337232	ESTs	12.7
108948	AA149579	Hs.118258	ESTs	6.8
109014	AA156790	Hs.262036	ESTs	15.3
109124	AA171529	Hs.183887	ESTs	6.1
109142	AA176438	Hs.41295	ESTs	5.1
109277	AA196332	Hs.86043	ESTs	5.5
109342	AA213620		Homo sapiens mRNA; cDNA DKFZp586M1418 (f	6
109562	F01811	Hs.187931	ESTs; Moderately similar to voltage-gate	10.8
109565	F01930	Hs.23648	ESTs	7
109648	F04600	Hs.7154	ESTs	9.9
109799	F10770	Hs.180378	Homo sapiens clone 669 unknown mRNA; com	6.4
109859	H02308	Hs.20792	ESTs	5.3
110181	H20276	Hs.31742	ESTs	16.8
110854	N32919	Hs.27931	ESTs	10
110924	N47938	Hs.12940	yy84a09.s1 Soares_multiple_sclerosis_2Nb	5.6
111046	N55514	Hs.318584	ESTs	6.9
111091	N59858	Hs.33032	Homo sapiens mRNA; cDNA DKFZp434N185 (fr	5.2
111157	N66613	Hs.99364	ESTs	5
111164	N66857	Hs.122489	ESTs; Weakly similar to !!!! ALU CLASS C	5.6
111221	N68869	Hs.15119	ESTs	6.2

111348	N90041	Hs.9585	ESTs	5.4
111353	N90430	Hs.6616	ESTs	5.3
111495	R07210	Hs.9683	ESTs	5.8
111540	R08850	Hs.9786	ESTs	6
111579	R10657	Hs.167115	KIAA0830 protein	12.6
111581	R10684	Hs.5794	ESTs	7.1
111734	R25375	Hs.128749	ESTs	6.2
111861	R37460	Hs.25231	ESTs	9.4
111870	R37778	Hs.18685	ESTs; Weakly similar to hypothetical pro	6.5
111937	R40431	Hs.14846	Homo sapiens mRNA; cDNA DKFZp564D016 (fr	4.8
111987	R42036	Hs.6763	KIAA0942 protein	6.4
112184	R49173	Hs.330242	ESTs	5.6
112286	R53765	Hs.158135	KIAA0981 protein	9.3
112380	R59740	Hs.5740	ESTs	4.7
112452	R63841	Hs.157461	ESTs	6
112601	R79111	Hs.78225	annexin A1	5.4
112753	R93696	Hs.169882	ESTs	5.8
112902	T09262	Hs.129190	ESTs	5.1
112984	T23457	Hs.289014	ESTs	4.9
113021	T23855	Hs.129836	KIAA1028 protein	10.8
113083	T40530	Hs.266957	ESTs; Weakly similar to heat shock prote	5.7
113200	T57773	Hs.10263	ESTs	7.3
113494	T88878	Hs.86538	ESTs	8.7
113849	W60439	Hs.8858	ESTs; Moderately similar to cbp146 [M.mu	4.9
113883	W72382	Hs.11958	oxidative 3 alpha hydroxysteroid dehydro	4.7
113950	W85765	Hs.30504	Homo sapiens mRNA; cDNA DKFZp434E082 (fr	6.7
113986	W87462	Hs.21894	ESTs	5.9
113989	W87544	Hs.268828	ESTs	4.7
114124	Z38595	Hs.125019	ESTs; Highly similar to KIAA0886 protein	21.3
114340	Z41395	Hs.143611	ESTs	9.6
114346	Z41450	Hs.130489	ESTs	5.2
114435	AA018216	Hs.164975	Bicaudal D (Drosophila) homolog 1	7.4
114463	AA025370	Hs.40109	KIAA0872 protein	8.2
114652	AA101416	Hs.107149	ESTs; Weakly similar to PTB-ASSOCIATED S	5.4
114721	AA131450	Hs.103822	ESTs	4.8
114730	AA133527	Hs.331328	ESTs; Weakly similar to The KIAA0138 gen	5.1
114833	AA234362	Hs.87159	ESTs; Moderately similar to CGI-66 prote	5.5
114860	AA235112	Hs.42179	ESTs; Moderately similar to similar to m	6.3
114884	AA235811	Hs.293672	ESTs	5.2
114895	AA236177	Hs.76591	KIAA0887 protein	4.7
114908	AA236545	Hs.54973	ESTs	5.2
114932	AA242751	Hs.16218	KIAA0903 protein	5.7
115084	AA255566	Hs.42484	Homo sapiens mRNA; cDNA DKFZp564C053 (fr	5.2
115140	AA258030	Hs.279938	ESTs; Weakly similar to supported by GEN	5.9
115468	AA287061	Hs.48499	ESTs; Highly similar to Bdeight protein	4.7
115583	AA398913	Hs.45231	LDOC1 protein	7.6
115709	AA412519	Hs.58279	ESTs	4.8
115772	AA423972	Hs.131740	ESTs	5
115774	AA424029	Hs.288390	ESTs; Moderately similar to dynamin; int	5.4
115776	AA424038	Hs.81897	ESTs	5
115821	AA427528	Hs.130965	ESTs; Weakly similar to ZINC FINGER PROT	13.7
115955	AA446121	Hs.44198	Homo sapiens BAC clone RG054D04 from 7q3	10.6
116024	AA451748	Hs.83883	Human DNA sequence from clone 718J7 on c	6.8
116108	AA457566	Hs.28777	ESTs	6
116117	AA459117	Hs.31575	SEC63; endoplasmic reticulum translocon	7.3
116146	AA460701	Hs.15423	ESTs	5.5
116296	AA489033	Hs.62601	Homo sapiens mRNA; cDNA DKFZp586K1318 (f	5.7
116379	AA521472	Hs.71252	ESTs	5.9
116393	AA599463	Hs.306051	protein phosphatase 2 (formerly 2A); reg	5.9
116401	AA599963	Hs.59698	ESTs	7.9
116416	AA609219	Hs.39982	ESTs	9.2
116587	D59325	Hs.121429	ESTs	5.2
116601	D80055	Hs.45140	ESTs	4.9
116684	F09156	Hs.66095	ESTs	7.2
116722	F13654		HSFIH32 Stratagene cat#937212 (1992) Hom	5.5
116766	H13260	Hs.95097	ESTs	5.9
117453	N29568	Hs.108319	thyroid hormone receptor-associated prot	6.9
117557	N33920	Hs.44532	diubiquitin	4.8
117708	N45114	Hs.126280	ESTs	6.3

118001	N52151	Hs.47447	ESTs	11.4
118229	N62339	Hs.166254	heat shock 90kD protein 1; alpha	6.2
118599	N69207	Hs.203697	ESTs	5.8
118645	N70358	Hs.125180	growth hormone receptor	7.1
118873	N89881	Hs.44577	ESTs	6
118985	N94303	Hs.55028	ESTs	9.3
119107	R42424	Hs.63841	ESTs	6
119126	R45175	Hs.117183	ESTs	17.9
119271	T16387	Hs.65328	ESTs	6
119367	T78324	Hs.250895	ESTs	5
119721	W69440	Hs.48376	ESTs	15.4
119741	W70205	Hs.43670	kinesin family member 3A	10.1
119780	W72967	Hs.191381	ESTs; Weakly similar to hypothetical pro	5.3
120217	Z41078	Hs.66035	ESTs	4.8
120266	AA173939	Hs.205442	ESTs; Weakly similar to inner centromere	8.8
120294	AA190888	Hs.153881	ESTs; Highly similar to NY-REN-62 antige	4.9
120418	AA236010	Hs.26613	Homo sapiens mRNA; cDNA DKFZp586F1323 (f	4.7
120486	AA253400	Hs.137569	tumor protein 63 kDa with strong homolog	5.6
120524	AA261852	Hs.192905	ESTs	4.9
120571	AA280738	Hs.34892	ESTs	8.8
120596	AA282074	Hs.237323	ESTs	6.2
120713	AA292655	Hs.96557	ESTs	9.9
120992	AA398246	Hs.97594	ESTs	16.4
121429	AA406293	Hs.41167	ESTs	6.9
121503	AA412049	Hs.290347	ESTs	7.6
121512	AA412105	Hs.193736	ESTs	5.8
121816	AA424814	Hs.48827	ESTs	4.6
122027	AA431302	Hs.98721	EST; Weakly similar to N-copine [H.sapie	5.6
122294	AA437311	Hs.98927	ESTs	5.7
122411	AA446859	Hs.99083	ESTs	6.5
122791	AA460158	Hs.129836	KIAA1028 protein	12.4
122792	AA460225	Hs.99519	ESTs	5.1
122969	AA478539	Hs.104336	ESTs	4.9
123095	AA485724	Hs.27413	ESTs	5.4
123100	AA485957	Hs.306219	Homo sapiens clone 25032 mRNA sequence	5
123295	AA495981	Hs.250830	ESTs	4.7
123311	AA496252	Hs.105069	ESTs	7.4
123583	AA609006	Hs.111240	ESTs	9.1
123619	AA609200		ESTs	4.7
123645	AA609310	Hs.188691	ESTs	4.8
123709	AA609651	Hs.112742	ESTs	7
123968	C14333	Hs.108327	damage-specific DNA binding protein 1 (1	5
124178	H45996	Hs.97101	putative G protein-coupled receptor	6.8
124352	N21626	Hs.102406	ESTs	10.2
124357	N22401		yw37g07.s1 Morton Fetal Cochlea Homo sap	10.6
124515	N58172	Hs.109370	ESTs	14.2
124911	R88992	Hs.174195	ESTs	4.8
125154	W38419		ESTs	4.7
125992	W01626		za36e07.r1 Soares fetal liver spleen 1NF	5.1
126802	AA947601	Hs.97056	ESTs	5.1
126812	Z36290	Hs.173933	ESTs; Weakly similar to NUCLEAR FACTOR 1	4.6
127080	AA662913	Hs.190173	ESTs	5
127308	AA507628	Hs.334390	ESTs	4.8
127370	AI024352	Hs.70337	immunoglobulin superfamily; member 4	4.7
127386	AI457411	Hs.106728	ESTs	4.8
127965	AA828760	Hs.292059	ESTs	4.8
128172	AI400862	Hs.265130	ESTs	5
128305	AI039722	Hs.279009	ESTs	5.8
128420	AI088155	Hs.41296	ESTs; Weakly similar to unknown [H.sapie	17
128467	AA176446	Hs.180428	ESTs; Weakly similar to hypothetical 43.	4.8
128610	L38608	Hs.10247	activated leucocyte cell adhesion molecu	7.9
128625	AA242816	Hs.102652	ESTs; Weakly similar to KIAA0437 [H.sapi	8.1
128651	AA446990	Hs.103135	ESTs	6.5
129088	AA215971	Hs.194431	KIAA0992 protein	5.2
129136	N26391	Hs.250723	ESTs	5.1
129171	AA234048	Hs.7753	calumenin	5.8
129229	AA211941	Hs.109643	polyadenylate binding protein-interactin	5.8
129386	N27524	Hs.260024	Cdc42 effector protein 3	5.2
129467	AA410311	Hs.44208	ESTs	5.1

129564	H22136	Hs.75295	guanylate cyclase 1; soluble; alpha 3	16.3
129699	AA458578	Hs.12017	KIAA0439 protein; homolog of yeast ubiqu	9.2
129821	F11019	Hs.12696	cortactin SH3 domain-binding protein	8.6
129823	X00948	Hs.105314	relaxin 2 (H2)	9.1
129847	W46767	Hs.296178	ESTs; Weakly similar to RNA POLYMERASE I	5.4
129912	AA047344	Hs.107213	ESTs; Highly similar to NY-REN-6 antigen	6.5
129958	L20591	Hs.1378	annexin A3	5.1
129977	J04076	Hs.1395	early growth response 2 (Krox-20 (Drosop	8.6
130061	U82256	Hs.172851	arginase; type II	7.4
130241	U78313	Hs.153203	MyoD family inhibitor	4.9
130466	N21679	Hs.180059	ESTs	5.8
130541	X05608	Hs.211584	neurofilament; light polypeptide (68kD)	6.7
130619	AA477739	Hs.12532	ESTs	6.4
130925	N71935	Hs.169378	multiple PDZ domain protein	7.9
130938	AA013250	Hs.21398	ESTs; Moderately similar to PUTATIVE GLU	6.2
130971	H20332	Hs.301444	signal sequence receptor; gamma (translo	6.4
131066	F09006	Hs.22588	ESTs	5
131126	F09012	Hs.181326	myotubularin related protein 2	6.4
131310	J02960	Hs.2551	adrenergic; beta-2-; receptor; surface	7.9
131487	AA253220	Hs.27373	Homo sapiens mRNA; cDNA DKFZp564O1763 (f	5.9
131561	X59841	Hs.294101	pre-B-cell leukemia transcription factor	7.6
131562	U90551	Hs.28777	H2A histone family; member L	5.1
131579	N62922	Hs.29088	ESTs	11
131629	AA442119	Hs.238809	ESTs	4.9
131682	AA428368	Hs.30654	ESTs	4.8
131699	R68657	Hs.90421	ESTs; Moderately similar to !!!! ALU SUB	6.5
131795	N32724	Hs.32317	Sox-like transcriptional factor	5.6
132053	H93381	Hs.38085	ESTs; Weakly similar to putative glycine	7.2
132122	U65092	Hs.40403	Cbp/p300-interacting transactivator; wit	5.6
132191	AA449431	Hs.288361	KIAA0741 gene product	8
132256	AA608856	Hs.431	murine leukemia viral (bmi-1) oncogene h	5.5
132482	AA429478	Hs.238126	ESTs; Highly similar to CGI-49 protein [	6.6
132533	AA021608	Hs.172510	ESTs	5.8
132572	AA448297	Hs.237825	signal recognition particle 72kD	6.2
132581	R42266	Hs.52256	ESTs; Weakly similar to beta-TrCP protei	16
132700	N47109	Hs.5521	ESTs	6.8
132701	AA279359	Hs.55220	BCL2-associated athanogene 2	5.3
132725	L41887	Hs.184167	splicing factor; arginine/serine-rich 7	7.8
132783	N74897	Hs.278894	DEAD/H (Asp-Glu-Ala-Asp/His) box polypep	5.9
132790	X75535	Hs.168670	peroxisomal farnesylated protein	8
132939	U76189	Hs.61152	exostoses (multiple)-like 2	5.2
133142	F03321	Hs.65874	ESTs	5.2
133342	U29589	Hs.7138	cholinergic receptor; muscarinic 3	10.3
133434	AA278852	Hs.30212	ESTs	5.8
133453	M68941	Hs.73826	protein tyrosine phosphatase; non-recept	4.9
133520	X74331	Hs.74519	primase; polypeptide 2A (58kD)	13.1
133544	T33873	Hs.74624	protein tyrosine phosphatase; receptor t	4.6
133608	D13315	Hs.75207	glyoxalase I	4.8
133626	H75939	Hs.75277	Homo sapiens mRNA; cDNA DKFZp586M141 (fr	5
133633	D21262	Hs.75337	nucleolar phosphoprotein p130	6.3
133797	S66431	Hs.76272	retinoblastoma-binding protein 2	6
133928	N34096	Hs.7766	ubiquitin-conjugating enzyme E2E 1 (homo	5.4
134095	U47414	Hs.79069	cyclin G2	5.2
134249	N89827	Hs.80667	RALBP1 associated Eps domain containing	6.5
134321	AA418230	Hs.8172	ESTs	7
134453	X70683	Hs.83484	SRY (sex determining region Y)-box 4	4.7
134542	X57025	Hs.85112	insulin-like growth factor 1 (somatomedi	7.7
134570	U66615	Hs.172280	SWI/SNF related; matrix associated; acti	6.4
134592	U82613	Hs.289104	Alu-binding protein with zinc finger dom	5.4
134654	W23625	Hs.8739	ESTs; Weakly similar to ORF YGR200c [S.c	5
134666	AA482319	Hs.8752	putative type II membrane protein	5.4
134806	Z49099	Hs.89718	spermine synthase	6.7
134951	AA431480	Hs.169358	ESTs	9.8
135066	X04602	Hs.93913	interleukin 6 (interferon; beta 2)	5.7
135155	AA358268	Hs.166556	ESTs; Moderately similar to transcriptio	4.9
135411	L10333	Hs.99947	reticulon 1	5.3
300023	M10098		AFFX control: 18S ribosomal RNA	4.6
300254	AW079607	Hs.55610	ESTs; Weakly similar to ZnT-3 [H.sapiens	7.8
300273	AW013907	Hs.167531	ESTs; Moderately similar to predicted us	11.5

300319	AW157646	Hs.153506	ESTs; Weakly similar to microtubule-acti	8.5
300566	H86709	Hs.326392	son of sevenless (Drosophila) homolog 1	5.8
300578	AI989417	Hs.134289	ESTs	4.4
300671	AI239706	Hs.93810	ESTs	7.9
300675	AA039352	Hs.125034	ESTs; Weakly similar to ORF YDL040c [S.c	4.5
300680	AW468086	Hs.24817	ESTs; Weakly similar to KIAA0986 protein	5.2
300762	AI497778	Hs.20509	ESTs	6.4
300810	AI076890	Hs.146847	ESTs	5.8
300813	AA406411	Hs.208341	ESTs; Weakly similar to KIAA0989 protein	10.6
300823	AI863068	Hs.106823	ESTs; Weakly similar to putative zinc fi	5.6
300834	AF109300	Hs.147924	ESTs	6.7
300923	AW136372	Hs.1852	ESTs	7.6
300962	AA593373	Hs.293744	ESTs	5.5
301015	AA947682	Hs.20252	ESTs; Weakly similar to Chain A; Cdc42hs	7
301042	AI659131	Hs.197733	ESTs	24.9
301242	AW161535	Hs.23782	ESTs	11.8
301254	AI049624	Hs.283390	EST cluster (not in UniGene) with exon h	4.3
301262	H29500	Hs.7130	ESTs; Moderately similar to N-copine [H.	4.3
301388	AA156879	Hs.262036	ESTs; Weakly similar to ZINC FINGER PROT	6.6
301563	AI802946	Hs.44208	ESTs; Weakly similar to match to ESTs AA	5.7
301656	AW008475	Hs.151258	EST cluster (not in UniGene) with exon h	6.8
301689	Z44810	Hs.301789	ESTs; Weakly similar to similar to C.ele	6.3
301783	AL046347	Hs.83937	Homo sapiens PAC clone DJ1159O04 from 7p	6.2
301805	AI800004	Hs.142846	ESTs; Weakly similar to MesP1 [M.musculu	8.5
301846	R20002	Hs.6823	ESTs; Weakly similar to intrinsic factor	4.6
301891	AF131855	Hs.279591	Homo sapiens clone 25056 mRNA sequence	6.3
302005	AI869666	Hs.123119	ESTs	36.8
302056	AI457532	Hs.30488	ESTs; Moderately similar to ROSA26AS [M.	9.5
302067	H05698	Hs.222399	ESTs; Weakly similar to protein-tyrosine	5.8
302099	AL021397	Hs.137576	ribosomal protein L34 pseudogene 1	8.8
302147	AB022660	Hs.151717	KIAA0437 protein	5.9
302214	AJ001454	Hs.159425	Homo sapiens mRNA for testican-3	4.3
302236	AI128606	Hs.6557	zinc finger protein 161	4.3
302358	D81150	Hs.322848	EST cluster (not in UniGene) with exon h	5.6
302410	NM_004917	Hs.218366	EST cluster (not in UniGene) with exon h	26.8
302486	AC003682	Hs.183512	multiple UniGene matches	8.2
302582	NM_000522	Hs.249195	EST cluster (not in UniGene) with exon h	6.4
302785	AA425562	Hs.11065	EST cluster (not in UniGene) with exon h	5
302792	AA343696	Hs.46821	ESTs; Weakly similar to putative [H.sapi	4.8
302881	AA508353	Hs.105314	relaxin 1 (H1)	78.8
302892	N58545	Hs.42346	histone deacetylase 3	8.5
302970	AW118352	Hs.312679	EST cluster (not in UniGene) with exon h	7.4
302977	AW263124	Hs.315111	EST cluster (not in UniGene) with exon h	5.5
303029	AF199613		EST cluster (not in UniGene) with exon h	4.6
303125	AF161352	Hs.111782	EST cluster (not in UniGene) with exon h	5.8
303280	AI571580	Hs.170307	ESTs	4.3
303306	AA215297	Hs.61441	EST cluster (not in UniGene) with exon h	6.4
303309	AL134184	Hs.145416	ESTs	6.6
303344	AA255977	Hs.250646	ESTs; Highly similar to ubiquitin-conjug	19.5
303380	AA298471	Hs.326567	EST cluster (not in UniGene) with exon h	6.6
303401	AA758552	Hs.309497	ESTs	6.8
303525	AW516519	Hs.273294	ESTs	4.8
303526	AA348111	Hs.96900	ESTs	12.1
303540	AA355607	Hs.309490	ESTs; Weakly similar to MMSET type I [H.	8.2
303572	AW338520	Hs.242540	ESTs	8.4
303685	AW500106	Hs.23643	EST cluster (not in UniGene) with exon h	4.9
303699	D30891	Hs.19525	EST cluster (not in UniGene) with exon h	15.7
303702	AW500748	Hs.224961	ESTs; Weakly similar to 73 kDA subunit o	6.3
303718	AI741397	Hs.114658	ESTs	4.6
303722	AA521510	Hs.145010	ESTs	12.5
303732	AW502405	Hs.125759	ESTs; Weakly similar to tumor suppressor	4.3
303735	AA707750	Hs.169055	ESTs; Weakly similar to cis-Golgi matrix	5.4
303752	AI017286	Hs.5957	EST cluster (not in UniGene) with exon h	5.3
303753	AW503733	Hs.9414	ESTs	13
303813	AI275850	Hs.114658	EST cluster (not in UniGene) with exon h	7.8
304053	R00493	Hs.125565	translocase of inner mitochondrial membr	4.8
304218	N66373	Hs.27973	ESTs; Weakly similar to ZK354.7 [C.elega	6
305200	AA668128	Hs.45207	EST singleton (not in UniGene) with exon	5.7
306716	AI024916	Hs.251354	ESTs	5.7

307848	AI364186		EST singleton (not in UniGene) with exon	7.3
307871	AI368665	Hs.31476	EST singleton (not in UniGene) with exon	5.4
308050	AI460004	Hs.31608	EST singleton (not in UniGene) with exon	8.1
308362	AI613519	Hs.105749	EST singleton (not in UniGene) with exon	5.5
308923	AI863051	Hs.279815	ESTs	4.4
309116	AI927149	Hs.29797	ribosomal protein L10	4.5
309375	AW075342	Hs.9271	EST singleton (not in UniGene) with exon	7.4
309674	AW205604	Hs.266009	ESTs; Weakly similar to !!!! ALU SUBFAMI	5
310095	AI921750	Hs.144871	ESTs	5
310098	AI685841	Hs.161354	ESTs	11.6
310250	AI478629	Hs.158465	ESTs	5.8
310365	AI262148	Hs.145569	ESTs	9.7
310382	AI734009	Hs.127699	EST cluster (not in UniGene)	10.4
310409	AI612775	Hs.145710	ESTs	4.6
310431	AI420227	Hs.149358	ESTs	72.9
310573	AW292180	Hs.156142	ESTs	7.6
310598	AI338013	Hs.140546	ESTs	9.2
310639	AW269082	Hs.175162	ESTs	4.5
310787	AW262580	Hs.147674	ESTs	4.9
310816	AI973051	Hs.224965	ESTs	7.6
311251	AI655662	Hs.197698	ESTs	41.3
311280	AI767957	Hs.198248	ESTs; Weakly similar to Y38A8.1 gene pro	4.5
311330	AI679524	Hs.201629	ESTs; Moderately similar to !!!! ALU SUB	4.6
311515	AW136713	Hs.23862	ESTs	5.9
311574	AI824863	Hs.211420	ESTs	4.8
311587	AI828254	Hs.271019	ESTs	5.8
311596	AI682088	Hs.79375	ESTs	26.4
311631	AI809519	Hs.27133	ESTs	6.4
311688	AW025661	Hs.240090	ESTs	7.4
311783	AI682478	Hs.13528	EST	4.6
311826	AA765470	Hs.85092	ESTs	6.7
311853	AW014013	Hs.107056	ESTs	5.3
311901	R16890	Hs.137135	ESTs	5.6
311932	AW451654	Hs.257482	ESTs	4.3
312153	AA759250	Hs.118625	cytochrome b-561	11
312182	AA834800	Hs.326263	EST cluster (not in UniGene)	16.9
312242	AI380207	Hs.125276	ESTs	4.7
312296	C01367	Hs.127128	ESTs	5.3
312407	R46180	Hs.153485	ESTs	6.2
312424	AA847398	Hs.291997	ESTs	4.8
312425	R49353	Hs.293892	ESTs	5.2
312480	R68651	Hs.144997	ESTs	9.5
312518	C17785	Hs.182738	ESTs	6.3
312521	AA033609	Hs.239884	ESTs	11.2
312527	AI695522	Hs.191271	ESTs	4.7
312539	AI004377	Hs.200360	ESTs	7
312546	AI623511	Hs.118567	ESTs	5.1
312563	AA976064	Hs.180842	ESTs	6.5
312623	AA694607	Hs.176956	EST cluster (not in UniGene)	10.8
312857	AA772279	Hs.126914	ESTs	5
312890	AI813654	Hs.5957	ESTs	5.8
312903	AA939266	Hs.278626	ESTs	7.7
312905	H92571	Hs.234478	ESTs	6.5
312976	AA836271	Hs.125830	ESTs	4.6
312983	AI079276	Hs.269899	ESTs	5.1
312996	AA249018	Hs.154331	EST cluster (not in UniGene)	7
313035	N36417	Hs.144928	ESTs	6.3
313166	AI801098	Hs.151500	ESTs	4.3
313188	AI039702	Hs.179573	collagen; type I; alpha 2	4.8
313218	AA827805	Hs.124296	ESTs	5
313226	AI200281	Hs.123910	ESTs	5.9
313325	AI420611	Hs.127832	ESTs	4.6
313326	AI088120	Hs.122329	ESTs	7.4
313425	AA745689	Hs.186838	ESTs; Weakly similar to similar to zinc	6.3
313499	AI261390	Hs.146085	ESTs	5.6
313540	AI797301	Hs.5740	ESTs	5.9
313568	AW467376	Hs.129640	ESTs	4.3
313569	AI273419	Hs.135146	ESTs; Weakly similar to ZK1058.5 [C.eleg	4.6
313603	AW468119	Hs.287631	EST cluster (not in UniGene)	6.8

313615	AW295194	Hs.301997	DKFZP434N126 protein	5.2
313625	AW468402	Hs.254020	ESTs	7.8
313634	AA688292	Hs.337786	ESTs	4.4
313635	AA507227	Hs.6390	ESTs	8.1
313638	AI753075	Hs.104627	ESTs	6.7
313670	C16690	Hs.23767	EST cluster (not in UniGene)	4.4
313671	W49823	Hs.104613	ESTs	4.4
313676	AA861697	Hs.120591	EST cluster (not in UniGene)	13.4
313703	AI161293	Hs.280380	ESTs; Weakly similar to KIAA0525 protein	10
313712	AA768553	Hs.74170	ESTs	5.2
313800	AW296132	Hs.55098	ESTs	5.4
313979	AI535895	Hs.221024	ESTs	4.3
314121	AI732100	Hs.187619	ESTs	13.6
314123	AW245993	Hs.223394	ESTs	6.4
314171	AI821895	Hs.193481	ESTs	29.4
314188	AL138431	Hs.164243	ESTs	4.6
314219	AL036001	Hs.48376	ESTs	5.7
314236	AA743396	Hs.189023	ESTs	4.9
314237	AA732359	Hs.96264	ESTs	4.4
314284	AA731431	Hs.293464	EST cluster (not in UniGene)	6.4
314305	AI280112	Hs.125232	ESTs	5.3
314343	AI754701	Hs.328476	ESTs; Weakly similar to alternatively sp	6.2
314530	AI052358	Hs.193726	ESTs	4.5
314691	AW207206	Hs.136319	ESTs	17
314695	AW502698	Hs.118152	ESTs	8.9
314785	AI538226	Hs.32976	ESTs	9.4
314801	AA481027	Hs.109045	ESTs; Weakly similar to ORF YGR245c [S.c	8
314864	AA493811	Hs.294068	ESTs	6
314907	AI672225	Hs.222886	ESTs	19.3
314916	AA548906	Hs.122244	ESTs	4.5
314954	AA521381	Hs.187726	ESTs	5.3
314981	AA524953	Hs.293334	ESTs	4.6
315021	AA533447	Hs.312989	EST cluster (not in UniGene)	5.1
315051	AW292425	Hs.163484	EST	16.5
315052	AA876910	Hs.134427	ESTs	20
315073	AW452948	Hs.257631	ESTs	5.3
315084	AI821085		ESTs	8.2
315214	AI915927	Hs.34771	ESTs	5.4
315220	AI420753	Hs.66731	ESTs	5.1
315278	AI985544	Hs.12450	ESTs	5.8
315282	AI222165	Hs.144923	ESTs	4.5
315368	AW291563	Hs.104696	ESTs	8
315369	AA764918	Hs.256531	ESTs	4.8
315378	AI263393	Hs.145008	ESTs	6.2
315379	AI378329	Hs.126629	ESTs	5.4
315402	AW293424	Hs.75354	ESTs	5.1
315442	AA977935	Hs.127274	ESTs	6.6
315443	AW003416	Hs.160604	ESTs	5.5
315528	R37257	Hs.184780	ESTs	8.1
315593	AW198103	Hs.158154	ESTs	9.9
315634	AA837085	Hs.220585	ESTs	7.8
315705	AW449285	Hs.313636	ESTs	8.9
315707	AI418055	Hs.161160	ESTs	5.1
315714	AA744015	Hs.298138	EST cluster (not in UniGene)	8.1
315740	T05558	Hs.156880	EST cluster (not in UniGene)	6.8
315762	AI391470	Hs.158618	ESTs	5.3
315769	AA744875	Hs.189413	ESTs	5
315843	AA679430	Hs.191897	ESTs	5.7
315990	AI800041	Hs.190555	ESTs	9.2
316012	AA764950	Hs.119898	ESTs	4.3
316036	AA708016	Hs.190389	ESTs	5.9
316055	AA693880	Hs.6947	EST cluster (not in UniGene)	6.7
316074	AW517542	Hs.293273	ESTs	5.5
316100	AW203986	Hs.213003	ESTs	5.1
316169	AI127483	Hs.120451	ESTs	8.2
316442	AA760894	Hs.153023	ESTs	17.1
316491	AA766025	Hs.186854	EST	4.6
316504	AW135854	Hs.132458	ESTs	4.3
316667	AW015940	Hs.232234	ESTs	7.6

316854	AA831215	Hs.159066	ESTs; Weakly similar to predicted using	5.1
316905	AW138241	Hs.210846	ESTs	6.4
317008	AW051597	Hs.143707	ESTs	4.4
317019	AA884968	Hs.127699	ESTs	11
317194	AW445167	Hs.126036	ESTs	13.5
317224	D56760	Hs.93029	ESTs	8.7
317404	AI806867	Hs.126594	ESTs	8.7
317501	AA931245	Hs.137097	ESTs	11.1
317548	AI654187	Hs.195704	ESTs	14.2
317651	AW292779	Hs.169799	ESTs	5.8
317758	AI733277	Hs.128321	ESTs	5.4
317850	N29974	Hs.152982	EST cluster (not in UniGene)	11.4
317869	AW295184	Hs.129142	ESTs; Weakly similar to DEOXYRIBONUCLEAS	13.8
317902	AI828602	Hs.211265	ESTs	5.3
317916	AI565071	Hs.159983	ESTs	7.7
318239	AI085198	Hs.164226	ESTs	13.1
318268	AI817736	Hs.182490	ESTs	6.2
318327	AW294013	Hs.200942	ESTs	4.6
318363	R45530	Hs.1440	gamma-aminobutyric acid (GABA) A recepto	6
318428	AI949409	Hs.194591	ESTs	12.3
318464	AI151010	Hs.157774	ESTs	4.3
318524	AW291511	Hs.159066	ESTs	25.9
318540	T30280	Hs.274803	EST cluster (not in UniGene)	7
318591	AW206806	Hs.115325	ESTs	4.8
318615	AI133617	Hs.10177	ESTs	6.5
318646	AW175665	Hs.278695	ESTs	6.7
318667	AI493742	Hs.165210	ESTs	11
318668	W26276	Hs.136075	ESTs	5.9
318753	AA578265	Hs.7130	copine IV	5.5
319080	Z45131	Hs.23023	ESTs	16.9
319181	F06504	Hs.27384	EST cluster (not in UniGene)	4.6
319191	AF071538	Hs.79414	prostate epithelium-specific Ets transcr	6.6
319233	R21054	Hs.180532	ESTs	4.9
319586	D78808	Hs.283683	ESTs	8.2
319750	AA621606	Hs.117956	ESTs	9.3
319763	AA460775	Hs.6295	ESTs	14.3
319824	AA424266	Hs.123642	EST cluster (not in UniGene)	12.8
319838	AA337642	Hs.95262	nuclear factor related to kappa B bindin	5.1
319913	AA179304	Hs.271586	ESTs; Moderately similar to !!!! ALU SUB	4.3
319964	T80579	Hs.290270	ESTs	5.8
320076	AI653733	Hs.271593	ESTs	8.5
320102	AW296219	Hs.115325	RAB7; member RAS oncogene family-like 1	9.8
320187	T99949	Hs.303428	EST cluster (not in UniGene)	9.8
320211	AL039402	Hs.125783	DEME-6 protein	7.9
320324	AF071202	Hs.139336	ATP-binding cassette; sub-family C (CFTR	56.2
320455	R49889	Hs.24144	EST cluster (not in UniGene)	8.3
320464	AI089817	Hs.237146	ESTs	5.4
320561	NM_006953	Hs.159330	EST cluster (not in UniGene)	7
320574	AL049443	Hs.161283	Homo sapiens mRNA; cDNA DKFZp586N2020 (f	4.4
320576	AL049977	Hs.162209	Homo sapiens mRNA; cDNA DKFZp564C122 (fr	6.7
320654	AW263086	Hs.118112	ESTs	6
320796	AF038966	Hs.31218	secretory carrier membrane protein 1	13.5
320800	AI681006	Hs.71721	ESTs	6.2
320813	AW360847	Hs.16578	ESTs	9.3
320853	AI473796	Hs.135904	ESTs	8.1
320856	D59945	Hs.65366	EST cluster (not in UniGene)	6
320899	AA633772	Hs.116798	ESTs	9.2
320918	AW195012	Hs.293970	ESTs	5
320973	H19732	Hs.247917	ESTs	5.9
321099	AA018386	Hs.64341	ESTs	4.6
321190	H52462	Hs.163872	EST cluster (not in UniGene)	5.8
321318	AB033041	Hs.137507	EST cluster (not in UniGene)	8.4
321382	AW372449	Hs.175982	EST cluster (not in UniGene)	7.3
321441	AW297633	Hs.118498	ESTs	14.7
321538	H80483	Hs.46903	EST cluster (not in UniGene)	9.2
321609	H86021	Hs.182538	ESTs; Weakly similar to hMmTRA1b [H.sapi	4.8
321636	AI791838	Hs.193465	ESTs	5.5
321638	AI356352	Hs.108932	ESTs	4.6
321644	AI204177	Hs.237396	ESTs	6.6

321681	AA233821	Hs.190173	EST cluster (not in UniGene)	4.6
321726	X91221	Hs.144465	EST cluster (not in UniGene)	5
321758	U29112	Hs.196151	EST cluster (not in UniGene)	6.2
321877	AL109784	Hs.189222	EST cluster (not in UniGene)	4.6
321899	N55158	Hs.29468	ESTs	4.6
321902	AA746374	Hs.145010	ESTs	8.2
322007	AW410846	Hs.164649	ESTs	5.1
322055	AL137646	Hs.146001	EST cluster (not in UniGene)	4.3
322092	AF085833	Hs.135624	EST cluster (not in UniGene)	4.3
322221	AI890619	Hs.179662	nucleosome assembly protein 1-like 1	4.4
322278	AF086283		EST cluster (not in UniGene)	5.8
322303	W07459	Hs.157601	EST cluster (not in UniGene)	22
322437	AW393804	Hs.170253	ESTs; Weakly similar to rabaptin-4 [H.sa	4.4
322493	AF143235	Hs.279819	EST cluster (not in UniGene)	7.2
322782	AA056060	Hs.202577	EST cluster (not in UniGene)	18.4
322811	AA782292	Hs.105872	ESTs	6.9
322818	AW043782	Hs.293616	ESTs	10.7
322826	AI807883	Hs.180059	ESTs	5
322887	AI986306	Hs.86149	ESTs; Weakly similar to KIAA0969 protein	11.9
322889	AA081924	Hs.124918	ESTs	7.1
322924	AA669253	Hs.136075	ESTs	4.5
322982	AI351191	Hs.128430	ESTs	6.6
322994	AA422116	Hs.191461	ESTs	4.7
323040	AA336609	Hs.10862	ESTs	6.9
323041	AL118747	Hs.26691	EST cluster (not in UniGene)	8.3
323045	AA148950	Hs.188836	ESTs	4.6
323048	AL118923	Hs.175110	EST cluster (not in UniGene)	7.5
323070	AA157726	Hs.264330	ESTs	7.5
323071	AA157867	Hs.5722	ESTs	4.7
323097	Z44354	Hs.296261	guanine nucleotide binding protein (G pr	4.9
323131	AA176982	Hs.270124	EST cluster (not in UniGene)	6.1
323136	AL120351	Hs.30177	EST cluster (not in UniGene)	4.3
323175	AI827137	Hs.336454	ESTs	6.2
323218	AF131846	Hs.13396	Homo sapiens clone 25028 mRNA sequence	6.3
323226	AF055019	Hs.21906	Homo sapiens clone 24670 mRNA sequence	12.6
323236	AA363148	Hs.293960	ESTs	10.9
323262	AI829770	Hs.190642	ESTs	7.6
323276	AA838452	Hs.323822	ESTs	7.6
323287	AA639902	Hs.104215	ESTs	24.7
323335	AI655499	Hs.161712	ESTs	14.1
323341	AL134875	Hs.108646	ESTs	5.3
323362	AL135067	Hs.117182	ESTs	6.1
323486	C05278	Hs.299221	ESTs; Moderately similar to [PYRUVATE DE	8.5
323496	AI826801	Hs.300700	ESTs	4.5
323507	H71721	Hs.128387	ESTs	4.4
323545	AI814405	Hs.224569	ESTs	5.8
323623	AA314280	Hs.146589	EST cluster (not in UniGene)	5
323663	AW263526	Hs.243023	ESTs	7.7
323691	AA317581	Hs.145599	EST cluster (not in UniGene)	5.9
323810	AA740405	Hs.108806	ESTs	6.2
323846	AA337621	Hs.137635	ESTs	6
323929	AA354940	Hs.145958	ESTs	10.7
323959	AI636775	Hs.6831	ESTs	5.4
323996	AA367032	Hs.217882	ESTs	5.8
323997	AA844907	Hs.274454	EST cluster (not in UniGene)	4.4
324019	AW177009		EST cluster (not in UniGene)	4.6
324130	AL046575	Hs.130198	ESTs	11
324295	AI146686	Hs.143691	ESTs	13.7
324298	AI524039	Hs.192524	ESTs	6.8
324307	AA627642	Hs.4994	transducer of ERBB2; 2 (TOB2)	4.9
324330	AA884766		EST cluster (not in UniGene)	4.3
324385	F28212	Hs.284247	EST cluster (not in UniGene)	4.7
324430	AA464018	Hs.184598	EST cluster (not in UniGene)	13.6
324452	AW014022	Hs.170953	ESTs	7.6
324547	AW501974	Hs.74170	ESTs	5.6
324603	AW016378	Hs.292934	ESTs	24.2
324617	AA508552	Hs.195839	ESTs	54
324618	AI346282	Hs.87159	ESTs	4.6
324620	AA448021	Hs.94109	EST cluster (not in UniGene)	5.7

324626	AI685464		ESTs	9	
324658	AI694767	Hs.129179	ESTs	22	
324676	AW503943	Hs.112451	ESTs	4.9	
324691	AI217963	Hs.293341	ESTs; Weakly similar to Pro-a2(XI) [H.sa	10.6	
324696	AA641092	Hs.257339	ESTs	10.2	
324713	AW340249	Hs.163440	ESTs	5.5	
324715	AI739168	Hs.131798	EST cluster (not in UniGene)	7.2	
324718	AI557019	Hs.116467	ESTs	34.4	
324720	AA578904	Hs.292437	ESTs	4.8	
324752	AI279919	Hs.272072	ESTs; Moderately similar to !!!! ALU SUB	7.9	
324753	AA612626	Hs.144871	EST cluster (not in UniGene)	5.2	
324790	AI334367	Hs.159337	ESTs	7.6	
324801	AI819924	Hs.14553	ESTs	12.6	
324804	AI692552		ESTs	6.5	
324845	AA361016	Hs.337533	ESTs	4.5	
324888	AI564134	Hs.136102	KIAA0853 protein	4.4	
324929	AI741633	Hs.125350	ESTs	6.5	
324961	AA613792		EST cluster (not in UniGene)	5.1	
325108	AA401863	Hs.22380	ESTs	7.1	
326816			CH.20_hs gi|6552458	9.6	
326997			CH.21_hs gi|5867660	4.8	
327098			CH.21_hs gi|6682516	4.3	
328492			CH.07_hs gi|5868455	5.8	
329362			CH.X_hs gi|5868837	4.3	
329929			CH.16_p2 gi|6165201	5.5	
329960			CH.16_p2 gi|5091594	7.6	
330020			CH.16_p2 gi|6671887	6	
330211			CH.05_p2 gi|6013592	12.6	
330384	M23263		androgen receptor (dihydrotestosterone r	9	
330430	HG2261-HT2352		Hs.321110	Antigen, Prostate Specific, Alt. Splice	13.8
330546	U31382	Hs.299867	guanine nucleotide binding protein 4	6	
330551	U39840		hepatocyte nuclear factor 3; alpha	4.9	
330658	AA319514	Hs.30732	ESTs	6	
330700	AA037415	Hs.20999	ESTs	5.5	
330704	AA056557	Hs.6759	ESTs	5.1	
330705	AA102571	Hs.157078	ESTs	11.7	
330706	AA121140	Hs.177576	ESTs; Moderately similar to kynurenine a	14.5	
330712	AA167269	Hs.52620	ESTs	5	
330725	AA252033	Hs.24052	ESTs; Weakly similar to !!!! ALU SUBFAMI	7.2	
330732	AA281092	Hs.35254	ESTs	4.9	
330762	AA449677	Hs.15251	Human DNA sequence from clone 437M21 on	18.5	
330763	AA450200	Hs.143187	FK506-binding protein 3 (25kD)	4.3	
330772	AA479114	Hs.11356	ESTs	5.8	
330786	D60374		EST	4.6	
330892	AA149579	Hs.91202	ESTs	15.3	
330949	H01458	Hs.142896	ESTs	10.3	
330977	H20826	Hs.315181	ESTs	4.4	
331017	N24619	Hs.108920	ESTs	11.8	
331099	R36671	Hs.14846	ESTs	11.6	
331128	R51361	Hs.268714	ESTs	4.8	
331151	R82331	Hs.268838	ESTs	13	
331195	T64447	Hs.168439	ESTs	4.9	
331320	AA262999	Hs.300141	ESTs	4.8	
331321	AA278355	Hs.87929	ESTs	6.1	
331337	AA287662	Hs.118630	ESTs	9.2	
331348	AA400596	Hs.88143	ESTs	9.9	
331359	AA416979	Hs.81897	ESTs	4.3	
331383	AA454543	Hs.43543	ESTs	4.6	
331422	F10802	Hs.237339	ESTs; Moderately similar to !!!! ALU SUB	4.9	
331442	H77381	Hs.41223	ESTs	7.5	
331466	N21680	Hs.43455	ESTs	5.4	
331479	N27154	Hs.44076	ESTs	6.5	
331490	N32912	Hs.291039	ESTs; Weakly similar to hypothetical 43.	12.5	
331493	N34357	Hs.93817	ESTs	4.6	
331561	N62780	Hs.48703	ESTs	9.2	
331615	N92352	Hs.5472	ESTs	4.6	
331659	W48868	Hs.334305	ESTs	8.7	
331696	Z38907	Hs.65949	KIAA0888 protein	10.3	
331811	AA404500	Hs.187958	ESTs	4.8	

331848	AA417039	Hs.98268	signal recognition particle 72kD	7.5
331873	AA429445	Hs.98640	ESTs	6.5
331889	AA431407	Hs.98802	Homo sapiens Chromosome 16 BAC clone CIT	33.6
331967	AA460158	Hs.99589	KIAA1028 protein	6.8
331974	AA464518	Hs.105322	ESTs	5.3
332043	AA490831	Hs.201591	ESTs	10.8
332076	AA599477	Hs.291156	ESTs	4.4
332173	F09281	Hs.100725	ESTs	5.5
332247	N58172		ESTs	14.2
332249	N62096	Hs.194140	ESTs	7.2
332325	T79428	Hs.339667	ESTs	5.6
332396	AA340504		ESTs; Weakly similar to similarto human	21.2
332434	N75542	Hs.237731	transcription factor 4	15.3
332493	N95495	Hs.56729	ESTs; Highly similar to GTP-binding prot	7.1
332522	L38503	Hs.178357	glutathione S-transferase theta 2	6.6
332526	AA281753	Hs.17731	inositol 1;4;5-triphosphate receptor; ty	5.8
332530	M31682	Hs.19280	inhibin; beta B (activin AB beta polypep	5.5
332533	M99487	Hs.325825	folate hydrolase (prostate-specific memb	38.1
332538	N48715	Hs.20991	ESTs	6.5
332546	D84454	Hs.22587	solute carrier family 35 (UDP-galactose	4.8
332594	AA279313	Hs.32951	methyl CpG binding protein 2	5.6
332610	AA412405	Hs.40513	ESTs; Weakly similar to BETA GALACTOSIDA	5.6
332661	N95742	Hs.6390	ESTs	6.9
332697	T94885	Hs.75725	carboxypeptidase E	24.3
332712	D26070	Hs.79306	inositol 1;4;5-triphosphate receptor; ty	9.9
332716	L00058	Hs.79630	v-myc avian myelocytomatosis viral oncog	5.6
332726	R72029	Hs.83428	synaptophysin-like protein	5
332781	AA233258		ESTs; Weakly similar to D1007.5 [C.elega	4.5
332797			CH22_FGENES.6_2	30.8
332798			CH22_FGENES.6_5	66.8
332799			CH22_FGENES.6_6	19.8
332933			CH22_FGENES.38_7	5.6
332980			CH22_FGENES.54_1	5.5
332984			CH22_FGENES.54_6	4.9
333168			CH22_FGENES.94_1	4.7
333169			CH22_FGENES.94_2	4.4
333452			CH22_FGENES.157_1	4.8
333456			CH22_FGENES.157_5	4.3
333458			CH22_FGENES.157_7	4.6
333611			CH22_FGENES.217_6	4.7
333621			CH22_FGENES.219_5	5.5
333814			CH22_FGENES.282_2	7.1
333849			CH22_FGENES.290_8	6.2
333949			CH22_FGENES.303_5	4.3
333951			CH22_FGENES.303_7	4.9
333955			CH22_FGENES.303_11	5.6
334150			CH22_FGENES.339_1	5.1
334223			CH22_FGENES.360_4	20.3
334297			CH22_FGENES.372_3	9.4
334443			CH22_FGENES.387_2	4.6
334444			CH22_FGENES.387_4	5.6
334447			CH22_FGENES.387_7	13.1
334570			CH22_FGENES.405_11	5.4
334749			CH22_FGENES.427_1	5.3
334777			CH22_FGENES.430_9	4.7
334960			CH22_FGENES.465_29	5.2
335179			CH22_FGENES.504_9	8.8
335293			CH22_FGENES.527_6	4.7
335550			CH22_FGENES.576_11	5.1
335581			CH22_FGENES.581_19	5.7
335586			CH22_FGENES.581_25	4.3
335809			CH22_FGENES.617_6	6.2
335810			CH22_FGENES.617_7	5.8
335822			CH22_FGENES.619_7	7.1
335824			CH22_FGENES.619_11	8.5
335853			CH22_FGENES.626_5	4.3
335886			CH22_FGENES.632_4	4.3
336034			CH22_FGENES.676_5	6.8
336441			CH22_FGENES.827_7	7.6

336624	CH22_FGENES.6-3	43.3
336625	CH22_FGENES.6-4	37.9
336679	CH22_FGENES.43-7	5.3
337577	CH22_C65E1.GENSCAN.8-1	4.9
338255	CH22_EM:AC005500.GENSCAN.276-3	13.4
338260	CH22_EM:AC005500.GENSCAN.279-10	4.6
338561	CH22_EM:AC005500.GENSCAN.421-5	4.6
338562	CH22_EM:AC005500.GENSCAN.421-6	4.3
338759	CH22_EM:AC005500.GENSCAN.517-6	5.1
338763	CH22_EM:AC005500.GENSCAN.517-16	5.5
338764	CH22_EM:AC005500.GENSCAN.517-17	7.1

TABLE 3A shows the accession numbers for those primekeys lacking unigeneID's for Table 3. For each probeset we have listed the gene cluster number from which the oligonucleotides were designed. Gene clusters were compiled using sequences derived from Genbank ESTs and mRNAs. These sequences were clustered based on sequence similarity using Clustering and Alignment Tools (DoubleTwist, Oakland California). The Genbank accession numbers for sequences comprising each cluster are listed in the "Accession" column.

Pkey: Unique Eos probeset identifier number
CAT number: Gene cluster number
Accession: Genbank accession numbers

Pkey	CAT number	Accession
123619	371681_1	AA602964 AA609200
116722	143512_1	Z24878 AA494098 F13654 AA494040 AA143127
103677	41847_1	Z83806 AJ132091 AJ132090
125992	1589048_1	H48372 W01626
109342	genbank_AA213620	AA213620
125154	genbank_W38419	W38419
101447	entrez_M21305	M21305
124357	genbank_N22401	N22401
108910	genbank_AA136590	AA136590
322278	47271_1	W69304 AF086283 W69200
315084	350959_1	AI821085 AW973464 AA554802 AI821831 AA657438 AA640756 AA650339
324019	262792_1	AW177009 AI381610
324330	300543_1	AA884766 AW974271 AA592975 AA447312
324626	336411_1	AI685464 AW971336 AA513587 AA525142
303029	37699_1	AF199613 AF108756
324804	398093_1	AI692552 AI393343 AI800510 AI377711 F24263 AA661876
324961	376239_1	AA613792 AW182329 T05304 AW858385
329362	c_x_hs	
336624	CH22_4071FG_6_3_	
336625	CH22_4072FG_6_4_	
336679	CH22_4157FG_43_7_	
338255	CH22_6856FG__LINK_EM:AC00	
338260	CH22_6863FG__LINK_EM:AC00	
329929	c16_p2	
329960	c16_p2	
338561	CH22_7294FG__LINK_EM:AC00	
338562	CH22_7295FG__LINK_EM:AC00	
338759	CH22_7581FG__LINK_EM:AC00	
338763	CH22_7585FG__LINK_EM:AC00	
338764	CH22_7586FG__LINK_EM:AC00	
333168	CH22_400FG_94_1_LINK_EM:A	
333169	CH22_401FG_94_2_LINK_EM:A	
333452	CH22_702FG_157_1_LINK_EM:	
333456	CH22_706FG_157_5_LINK_EM:	
333458	CH22_708FG_157_7_LINK_EM:	
333611	CH22_872FG_217_6_LINK_EM:	
333621	CH22_882FG_219_5_LINK_EM:	
333814	CH22_1083FG_282_2_LINK_EM	
333849	CH22_1118FG_290_8_LINK_EM	
335179	CH22_2515FG_504_9_LINK_EM	
333949	CH22_1225FG_303_5_LINK_EM	
333951	CH22_1227FG_303_7_LINK_EM	
333955	CH22_1231FG_303_11_LINK_E	
335293	CH22_2635FG_527_6_LINK_EM	
326816	c20_hs	
326997	c21_hs	
335550	CH22_2905FG_576_11_LINK_E	
335581	CH22_2938FG_581_19_LINK_E	
335586	CH22_2944FG_581_25_LINK_E	

328492	c_7_hs	
335809	CH22_3181FG_617_6_LINK_EM	
335810	CH22_3182FG_617_7_LINK_EM	
335822	CH22_3195FG_619_7_LINK_EM	
335824	CH22_3197FG_619_11_LINK_E	
335853	CH22_3228FG_626_5_LINK_EM	
335886	CH22_3261FG_632_4_LINK_EM	
330020	c16_p2	
330211	c_5_p2	
337577	CH22_5864FG__LINK_C65E1.G	
307848	AI364186	
332797	CH22_13FG_6_2_LINK_C4G1.G	
332798	CH22_14FG_6_5_LINK_C4G1.G	
332799	CH22_15FG_6_6_LINK_C4G1.G	
334150	CH22_1429FG_339_1_LINK_EM	
332933	CH22_154FG_38_7_LINK_C20H	
332980	CH22_204FG_54_1_LINK_EM:A	
332984	CH22_208FG_54_6_LINK_EM:A	
334223	CH22_1507FG_360_4_LINK_EM	
334297	CH22_1588FG_372_3_LINK_EM	
327098	c21_hs	
334443	CH22_1742FG_387_2_LINK_EM	
334444	CH22_1743FG_387_4_LINK_EM	
334447	CH22_1746FG_387_7_LINK_EM	
334570	CH22_1875FG_405_11_LINK_E	
334749	CH22_2061FG_427_1_LINK_EM	
334777	CH22_2089FG_430_9_LINK_EM	
336034	CH22_3419FG_678_5_LINK_DJ	
334960	CH22_2281FG_465_29_LINK_E	
336441	CH22_3861FG_827_7_LINK_DJ	
330551	9851_2	U39840 NM_004496 AW135607 BE087458 BE087567 AA177116 AW195705 AW750756 AI811008 AI694151 BE348594 AW971075 AI347950 AI201455 AI073898 AA652680 AA613671 AI318364 AA507550 AA693692 AI032599 AA991871 AI269801 AW948974 T74639 AA532907 AW949173
330786	53973_3	BE379594 AI192455 AL039862 AI744012 AI761735 AW243181 AI743687 AI928223 AI423022 AI627855 AI636059 AI651571 AW802044 AI826995 AI431733 AI539125 AA863056 AW270910 AI768930 AW008835 AW615183 AW591147 AI695294 AI672106 AA506358 AI308060 AA011556 AA962437 AI935488 BE219625 AI004356 AW151394 AI218466 N66178 AI419784 AW242519 AW946907 D60374 AA989263 AI698799 AA470460 AI824167
332247	372969_1	AA669097 AA513815 AA026798 AA676526 AA704429 AA704269 AW118292 AA579216 N58172
332396	20265_1	AW579842 BE156562 BE156690 BE156489 BE081033 AK001559 BE149402 M85387 AW367811 AW367798 R17370 AI908847 AA382932 R58449 H18732 AA371231 AW962899 AA713530 AW892946 R53463 H11063 AW068542 Z40761 BE176212 BE176155 W23952 W92188 AW374883 AA303497 AW954769 AA036808 BE168063 AW382073 AW382085 AL041475 H80748 AI078161 BE463983 AI805213 AI761264 W94885 N94502 AI623772 AI419532 AI810302 AI634190 AW002516 AW150777 AI352312 AI367474 AW204807 AI675502 AI337026 AW134715 BE328451 AI123157 AI560020 AI300745 AI608631 AI248873 AA742484 AW051635 H18646 AI245045 AA507111 AI640510 AI925594 AA115747 AA143035 AA151106
332781	32044_1	AK001764 BE313896 AA380199 AA380151 AA194996 AW118089 AA495871 AW975219 AW085598 AI378909 AW992310 AW992409 AI911857 AA657643 AI804471 AI242589 AI623968 R09556 AI129100 AI206500 AA680094 AA677784 AI023178 AI277519 AA424742 AI240654 AA232846 AI804273 AI382376 AA001729 W90790 BE090656 AW295015 AI674596 AI431734 AI420517 AW769185 AI128355 AI192474 AI820001 AA001929 AA706925 AI076676 AI499119 AI200493 AI695919 AI376217 W69195 W69261 AW305099 W90320 BE048357 AI658856 AA838534 AA233258 AI753393 AA709227 AI674387 AI872616

TABLE 3B shows the genomic positioning for those primekeys lacking unigene ID's and accession numbers in Table 3. For each predicted exon, we have listed the genomic sequence source used for prediction. Nucleotide locations of each predicted exon are also listed.

Pkey: Unique number corresponding to an Eos probeset
Ref: Sequence source. The 7 digit numbers in this column are Genbank Identifier (GI) numbers. "Dunham I. et al." refers to the publication entitled "The DNA sequence of human chromosome 22." Dunham I. et al., Nature (1999) 402:489-495.
Strand: Indicates DNA strand from which exons were predicted.
Nt_position: Indicates nucleotide positions of predicted exons.

Pkey	Ref	Strand	Nt_position
333611	Dunham, I. et.al.	Plus	6548368-6548507
333621	Dunham, I. et.al.	Plus	8597414-8597560
333814	Dunham, I. et.al.	Plus	7894165-7894252
333849	Dunham, I. et.al.	Plus	8018323-8018472
333949	Dunham, I. et.al.	Plus	8589634-8589791
333951	Dunham, I. et.al.	Plus	8592501-8592637
333955	Dunham, I. et.al.	Plus	8597414-8597560
334150	Dunham, I. et.al.	Plus	10529221-10529854
334297	Dunham, I. et.al.	Plus	13420934-13421058
334443	Dunham, I. et.al.	Plus	14298981-14299056
334444	Dunham, I. et.al.	Plus	14306433-14306492
334447	Dunham, I. et.al.	Plus	14308764-14308824
334570	Dunham, I. et.al.	Plus	14994868-14994943
334777	Dunham, I. et.al.	Plus	16259586-16260166
335179	Dunham, I. et.al.	Plus	21634405-21634526
335581	Dunham, I. et.al.	Plus	24976198-24976334
335586	Dunham, I. et.al.	Plus	24990333-24990497
335809	Dunham, I. et.al.	Plus	26310772-26310909
335810	Dunham, I. et.al.	Plus	26314767-26314849
335822	Dunham, I. et.al.	Plus	26364087-26364196
335824	Dunham, I. et.al.	Plus	26376860-26376942
335886	Dunham, I. et.al.	Plus	26934235-26934364
336034	Dunham, I. et.al.	Plus	29014404-29014590
336441	Dunham, I. et.al.	Plus	34187606-34187663
337577	Dunham, I. et.al.	Plus	595377-595678
338260	Dunham, I. et.al.	Plus	15458919-15459257
332797	Dunham, I. et.al.	Minus	216964-216798
332798	Dunham, I. et.al.	Minus	232147-231974
332799	Dunham, I. et.al.	Minus	232421-232307
332933	Dunham, I. et.al.	Minus	2035790-2035681
332980	Dunham, I. et.al.	Minus	5136165-5136019
332984	Dunham, I. et.al.	Minus	2632606-2632457
333168	Dunham, I. et.al.	Minus	3729896-3729788
333169	Dunham, I. et.al.	Minus	3730864-3730767
333452	Dunham, I. et.al.	Minus	5136165-5136019
333456	Dunham, I. et.al.	Minus	2631933-2631797
333458	Dunham, I. et.al.	Minus	5143942-5143806
334223	Dunham, I. et.al.	Minus	12734365-12734269
334749	Dunham, I. et.al.	Minus	16090686-16090106
334960	Dunham, I. et.al.	Minus	20160968-20160795
335293	Dunham, I. et.al.	Minus	22316408-22316275
335550	Dunham, I. et.al.	Minus	24668714-24668658
335853	Dunham, I. et.al.	Minus	26614629-26614506
336624	Dunham, I. et.al.	Minus	227714-227577
336625	Dunham, I. et.al.	Minus	229124-229024
336679	Dunham, I. et.al.	Minus	2035790-2035681
338255	Dunham, I. et.al.	Minus	15242294-15242231
338561	Dunham, I. et.al.	Minus	22311966-22311856
338562	Dunham, I. et.al.	Minus	22312594-22312465
338759	Dunham, I. et.al.	Minus	26582475-26582199
338763	Dunham, I. et.al.	Minus	26628148-26628009
338764	Dunham, I. et.al.	Minus	26641232-26641101

329960	5091594	Minus	1031-1162
329929	6165201	Minus	156410-156553
330020	6671887	Plus	172397-172491
326816	6552458	Plus	198354-198436
326997	5887660	Minus	71389-72147
327098	6682516	Minus	1061684-1062361
330211	6013592	Plus	59158-59215
328492	5868455	Minus	46094-46241
329362	5868837	Minus	65688-68173

TABLE 4: shows a preferred subset of the Accession numbers for genes found in Table 3 which are differentially expressed in prostate tumor tissue compared to normal prostate tissue.

Pkey: Unique Eos probeset identifier number
ExAccn: Exemplar Accession number, Genbank accession number
UnigeneID: Unigene number
Unigene Title: Unigene gene title
R1: Ratio of tumor to normal body tissue

Pkey	ExAccn	UnigeneID	Unigene Title	R1
100819	HG4020-HT4290	Hs.2387	Transglutaminase	10.5
102698	U75272	Hs.1867	progastricsin (pepsinogen C)	10.6
102869	X02544	Hs.572	orosomucoid 1	22.6
105370	AA236476	Hs.22791	ESTs; Weakly similar to transmembrane pr	10.3
105645	AA282138	Hs.11325	ESTs	14
106094	AA419461	Hs.23317	ESTs	10.9
109014	AA156790	Hs.262036	ESTs	15.3
109562	F01811	Hs.187931	ESTs; Moderately similar to voltage-gate	10.8
113021	T23855	Hs.129836	KIAA1028 protein	10.8
114124	Z38595	Hs.125019	ESTs; Highly similar to KIAA0886 protein	21.3
122791	AA460158	Hs.129836	KIAA1028 protein	12.4
124352	N21626	Hs.102406	ESTs	10.2
301042	AI659131	Hs.197733	ESTs	24.9
302005	AI869666	Hs.123119	ESTs	38.8
302410	NM_004917	Hs.218366	EST cluster (not in UniGene) with exon h	26.8
302881	AA508353	Hs.105314	relaxin 1 (H1)	78.8
303344	AA255977	Hs.250646	ESTs; Highly similar to ubiquitin-conjug	19.5
303753	AW503733	Hs.9414	ESTs	13
310431	AI420227	Hs.149358	ESTs	72.9
311251	AI655662	Hs.197698	ESTs	41.3
311596	AI682088	Hs.79375	ESTs	26.4
312153	AA759250	Hs.118625	cytochrome b-561	11
312521	AA033609	Hs.239884	ESTs	11.2
313676	AA861697	Hs.120591	EST cluster (not in UniGene)	13.4
314171	AI821895	Hs.193481	ESTs	29.4
314907	AI672225	Hs.222886	ESTs	19.3
315051	AW292425	Hs.163484	EST	15.5
315052	AA876910	Hs.134427	ESTs	20
317548	AI654187	Hs.195704	ESTs	14.2
317869	AW295184	Hs.129142	ESTs; Weakly similar to DEOXYRIBONUCLEAS	13.8
318428	AI949409	Hs.194591	ESTs	12.3
318524	AW291511	Hs.159066	ESTs	25.9
319080	Z45131	Hs.23023	ESTs	16.9
319763	AA460775	Hs.6295	ESTs	14.3
320324	AF071202	Hs.139336	ATP-binding cassette; sub-family C (CFTR	56.2
321441	AW297633	Hs.118498	ESTs	14.7
322303	W07459	Hs.157601	EST cluster (not in UniGene)	22
322782	AA056060	Hs.202577	EST cluster (not in UniGene)	18.4
322818	AW043782	Hs.293616	ESTs	10.7
323287	AA639902	Hs.104215	ESTs	24.7
324603	AW016378	Hs.292934	ESTs	24.2
324617	AA508552	Hs.195839	ESTs	54
324658	AI694767	Hs.129179	ESTs	22
324691	AI217963	Hs.293341	ESTs; Weakly similar to Pro-a2(XI) [H.sa	10.6
324696	AA641092	Hs.257339	ESTs	10.2
324718	AI557019	Hs.116467	ESTs	34.4
330211			CH.05_p2 gi|6013592	12.6
330430	HG2261-HT2352	Hs.321110	Antigen, Prostate Specific, Alt. Splice	13.8
330706	AA121140	Hs.177576	ESTs; Moderately similar to kynurenine a	14.5
330762	AA449677	Hs.15251	Human DNA sequence from clone 437M21 on	18.5
330892	AA149579	Hs.91202	ESTs	15.3
330949	H01458	Hs.142896	ESTs	10.3

331099	R36671	Hs.14846	ESTs	11.6
331151	R82331	Hs.268838	ESTs	13
331889	AA431407	Hs.98802	Homo sapiens Chromosome 16 BAC clone CIT	33.6
332247	N58172		ESTs	14.2
332396	AA340504		ESTs; Weakly similar to similarto human	21.2
332533	M99487	Hs.325825	folate hydrolase (prostate-specific memb	38.1
332697	T94885	Hs.75725	carboxypeptidase E	24.3
332797			CH22_FGENES.6_2	30.8
332798			CH22_FGENES.6_5	66.8
332799			CH22_FGENES.6_6	19.8
334223			CH22_FGENES.360_4	20.3
336624			CH22_FGENES.6-3	43.3
336625			CH22_FGENES.6-4	37.9

TABLE 4A shows the accession numbers for those primekeys lacking unigeneID's for Table 4. For each probeset we have listed the gene cluster number from which the oligonucleotides were designed. Gene clusters were compiled using sequences derived from Genbank ESTs and mRNAs. These sequences were clustered based on sequence similarity using Clustering and Alignment Tools (DoubleTwist, Oakland California). The Genbank accession numbers for sequences comprising each cluster are listed in the "Accession" column.

Pkey: Unique Eos probeset identifier number
CAT number: Gene cluster number
Accession: Genbank accession numbers

Pkey	CAT number	Accession
336624	CH22_4071FG_6_3_	
336625	CH22_4072FG_6_4_	
330211	c_5_p2	
332797	CH22_13FG_6_2_LINK_C4G1.G	
332798	CH22_14FG_6_5_LINK_C4G1.G	
332799	CH22_15FG_6_6_LINK_C4G1.G	
334223	CH22_1507FG_360_4_LINK_EM	
332247	372969_1	AA669097 AA513815 AA026798 AA676526 AA704429 AA704269 AW118292 AA579216 N58172
332396	20265_1	AW579842 BE156562 BE156690 BE156489 BE081033 AK001559 BE149402 M85387 AW367811 AW367798 R17370 AI908947 AA382932 R58449 H18732 AA371231 AW962899 AA713530 AW892946 R53463 H11063 AW068542 Z40761 BE176212 BE176155 W23952 W92188 AW374883 AA303497 AW954769 AA036808 BE168063 AW382073 AW382085 AL041475 H80748 AI078161 BE463983 AI805213 AI761264 W94885 N94502 AI623772 AI419532 AI810302 AI634190 AW002516 AW150777 AI352312 AI367474 AW204807 AI675502 AI337026 AW134715 BE328451 AI123157 AI560020 AI300745 AI608631 AI248873 AA742484 AW051635 H18646 AI245045 AA507111 AI640510 AI925594 AA115747 AA143035 AA151106

TABLE 4B shows the genomic positioning for those primekeys lacking unigene ID's and accession numbers in Table 4. For each predicted exon, we have listed the genomic sequence source used for prediction. Nucleotide locations of each predicted exon are also listed.

Pkey: Unique number corresponding to an Eos probeset
Ref: Sequence source. The 7 digit numbers in this column are Genbank Identifier (GI) numbers. "Dunham I. et al." refers to the publication entitled "The DNA sequence of human chromosome 22." Dunham I. et al., Nature (1999) 402:489-495.
Strand: Indicates DNA strand from which exons were predicted.
Nt_position: Indicates nucleotide positions of predicted exons.

Pkey	Ref	Strand	Nt_position
332797	Dunham, I. et.al.	Minus	216964-216798
332798	Dunham, I. et.al.	Minus	232147-231974
332799	Dunham, I. et.al.	Minus	232421-232307
334223	Dunham, I. et.al.	Minus	12734365-12734269
336624	Dunham, I. et.al.	Minus	227714-227577
336625	Dunham, I. et.al.	Minus	229124-229024
330211	6013592	Plus	59158-59215

TABLE 5: 1170 GENES UP-REGULATED IN PROSTATE CANCER COMPARED TO NORMAL ADULT TISSUES

Table 5 shows 1170 genes up-regulated in prostate cancer compared to normal adult tissues. These were selected from 59680 probesets on the Affymetrix/Eos Hu03 GeneChip array such that the ratio of "average" prostate cancer to "average" normal adult tissues was greater than or equal to 3.44. The "average" prostate cancer level was set to the 85[th] percentile amongst 73 prostate cancers. The "average" normal adult tissue level was set to the 85[th] percentile amongst 162 non-malignant tissues. In order to remove gene-specific background levels of non-specific hybridization, the 7.5[th] percentile value amongst the 162 non-malignant tissues was subtracted from both the numerator and the denominator before the ratio was evaluated.

Pkey: Unique Eos probeset identifier number
ExAccn: Exemplar Accession number, Genbank accession number
UnigeneID: Unigene number
Unigene Title: Unigene gene title
R1: Ratio of tumor to normal tissue

Pkey	ExAccn	UnigeneID	Unigene Title	R1
446057	AI420227	Hs.149358	ESTs, Weakly similar to A46010 X-linked	86.42
400302	N48056	Hs.1915	folate hydrolase (prostate-specific memb	66.46
414569	AF109298	Hs.118258	prostate cancer associated protein 1	58.36
417407	AA923278	Hs.290905	ESTs, Weakly similar to protease [H.sapi	56.16
431579	AW971082	Hs.222886	ESTs, Weakly similar to TRHY_HUMAN TRICH	53.38
409361	NM_005982	Hs.54416	sine oculis homeobox (Drosophila) homolo	48.28
409731	AA125985	Hs.56145	thymosin, beta, identified in neuroblast	45.24
400298	AA032279	Hs.61635	six transmembrane epithelial antigen of	43.48
420154	AI093155	Hs.95420	JM27 protein	41.12
433486	AA508353	Hs.105314	relaxin 1 (H1)	39.88
400296	AA305627	Hs.139336	ATP-binding cassette, sub-family C (CFTR	38.42
400292	AA250737	Hs.72472	ESTs	38.00
432887	AI926047	Hs.162859	ESTs	36.48
439176	AI446444	Hs.190394	ESTs, Weakly similar to B28096 line-1 pr	36.45
430722	AW968543	Hs.203270	ESTs, Weakly similar to ALU1_HUMAN ALU S	33.20
437052	AA861697	Hs.120591	ESTs	33.02
418396	AI765805	Hs.26691	ESTs	32.68
434036	AI659131	Hs.197733	hypothetical protein MGC2849	32.44
407709	AA456135	Hs.23023	ESTs	32.10
426747	AA535210	Hs.171995	kallikrein 3, (prostate specific antigen	31.80
407168	R45175		ESTs	31.72
440260	AI972867	Hs.7130	copine IV	30.52
421513	X00949	Hs.105314	relaxin 1 (H1)	30.10
416370	N90470	Hs.203697	ESTs, Weakly similar to I38022 hypotheti	29.68
407122	H20276	Hs.31742	ESTs	29.24
400287	S39329	Hs.181350	kallikrein 2, prostatic	28.90
432244	AI669973	Hs.200574	ESTs	28.74
451939	U80456	Hs.27311	single-minded (Drosophila) homolog 2	28.74
415989	AI267700	Hs.111128	ESTs	28.34
418961	AW967646	Hs.23023	ESTs	27.34
425628	NM_004476	Hs.1915	folate hydrolase (prostate-specific memb	27.32
458509	AA654650	Hs.282906	ESTs	27.24
448290	AK002107	Hs.20843	Homo sapiens cDNA FLJ11245 fis, clone PL	27.16
428336	AA503115	Hs.183752	microseminoprotein, beta-	26.17
450096	AI682088	Hs.223368	holocarboxylase synthetase (biotin-[prop	25.60
400299	X07730	Hs.171995	kallikrein 3, (prostate specific antigen	24.91
437571	AA760894	Hs.153023	ESTs	24.74
453160	AI263307	Hs.146228	H2B histone family, member L	24.66
453096	AW294631	Hs.11325	ESTs	24.46
425075	AA506324	Hs.1852	acid phosphatase, prostate	24.23
407202	N58172	Hs.109370	ESTs	24.18

424846	AU077324	Hs.1832	neuropeptide Y	23.57
453370	AI470523	Hs.182356	ATP-binding cassette, sub-family C (CFTR	23.16
422805	AA436989	Hs.121017	H2A histone family, member A	22.52
444917	R68651	Hs.144997	ESTs	22.26
408826	AF216077	Hs.48376	Homo sapiens clone HB-2 mRNA sequence	22.02
413597	AW302885	Hs.117183	ESTs	21.76
426429	X73114	Hs.169849	myosin-binding protein C, slow-type	21.32
435981	H74319	Hs.188620	ESTs	21.12
432966	AA650114		ESTs	21.07
418848	AI820961	Hs.193465	ESTs	21.06
405685				20.90
443271	BE568568	Hs.195704	ESTs	19.98
418819	AA228776	Hs.191721	ESTs	19.94
420757	X78592	Hs.99915	androgen receptor (dihydrotestosterone r	19.72
418994	AA296520	Hs.89546	selectin E (endothelial adhesion molecul	19.56
429918	AW873986	Hs.119383	ESTs	19.04
415539	AI733881	Hs.72472	ESTs	18.43
450382	AA397658	Hs.60257	Homo sapiens cDNA FLJ13598 fis, clone PL	18.34
418829	AA516531	Hs.55999	NK homeobox (Drosophila), family 3, A	18.28
429984	AL050102	Hs.227209	hypothetical protein FLJ21617	17.82
443822	AI087412	Hs.143611	ESTs, Weakly similar to 2004399A chromos	17.66
431676	AI685464	Hs.292638	gb:tt88f04.x1 NCI_CGAP_Pr28 Homo sapiens	17.64
410330	AW023630	Hs.46786	ESTs	17.52
432441	AW292425	Hs.163484	ESTs	17.41
452792	AB037765	Hs.30652	KIAA1344 protein	17.39
445472	AB006631	Hs.12784	Homo sapiens mRNA for KIAA0293 gene, par	17.00
414565	AA502972	Hs.183390	hypothetical protein FLJ13590	16.82
430487	D87742	Hs.241552	KIAA0268 protein	16.72
431716	D89053	Hs.268012	fatty-acid-Coenzyme A ligase, long-chain	16.60
419536	AA603305		gb:np12d11.s1 NCI_CGAP_Pr3 Homo sapiens	16.50
439677	R82331	Hs.164599	ESTs	16.46
449625	NM_014253	Hs.23796	odz (odd Oz/ten-m, Drosophila) homolog 1	16.32
408430	S79876	Hs.44926	dipeptidylpeptidase IV (CD26, adenosine	16.28
447033	AI357412	Hs.157601	ESTs	16.02
453006	AI362575	Hs.167133	ESTs	15.74
431474	AL133990	Hs.190642	ESTs	15.70
420218	AW958037	Hs.22437	ribosomal protein L4	15.64
408000	L11690	Hs.620	bullous pemphigoid antigen 1 (230/240kD)	15.54
416208	AW291168	Hs.41295	ESTs, Weakly similar to MUC2_HUMAN MUCIN	15.48
430228	BE245562	Hs.2551	adrenergic, beta-2-, receptor, surface	15.40
415263	AA948033	Hs.130853	ESTs	15.38
432437	W07088	Hs.293685	ESTs	15.26
428398	AI249368	Hs.98558	ESTs	15.21
429900	AA460421	Hs.30875	ESTs	14.90
449156	AF103907	Hs.171353	prostate cancer antigen 3	14.89
411096	U80034	Hs.68583	mitochondrial intermediate peptidase	14.81
435974	U29690	Hs.37744	Homo sapiens beta-1 adrenergic receptor	14.76
444484	AK002126	Hs.11260	hypothetical protein FLJ11264	14.76
422728	AW937826	Hs.103262	ESTs, Weakly similar to ZN91_HUMAN ZINC	14.60
418601	AA279490	Hs.86368	calmegin	14.56
448999	AF179274	Hs.22791	transmembrane protein with EGF-like and	14.55
445885	AI734009	Hs.127699	KIAA1603 protein	14.44
452712	AW838616		gb:RC5-LT0054-140200-013-D01 LT0054 Homo	14.22
432189	AA527941		gb:nh30c04.s1 NCI_CGAP_Pr3 Homo sapiens	14.12
424565	AW102723	Hs.75295	guanylate cyclase 1, soluble, alpha 3	13.78
429290	AF203032	Hs.198760	neurofilament, heavy polypeptide (200kD)	13.57
419264	AA877104	Hs.293672	ESTs, Weakly similar to ALUB_HUMAN !!!!	13.40
416445	AL043004	Hs.300678	KIAA0135 protein	13.32
407275	AI364186		gb:qw34h07.x1 NCI_CGAP_Ut4 Homo sapiens	13.24
408369	R38438	Hs.182575	solute carrier family 15 (H+/peptide tra	13.21
446720	AI439138	Hs.140546	ESTs	13.06
434988	AI418055	Hs.161160	ESTs	13.02
448172	N75276	Hs.135904	ESTs	12.98
416182	NM_004354	Hs.79069	cyclin G2	12.94
420544	AA677577	Hs.98732	Homo sapiens Chromosome 16 BAC clone CIT	12.79
445413	AA151342	Hs.12677	CGI-147 protein	12.64
452588	AA889120	Hs.110637	homeo box A10	12.62
407819	R42185	Hs.274803	ESTs	12.60
433444	AW975324	Hs.129816	ESTs	12.60

421059	AI654133	Hs.30212	thyroid receptor interacting protein 15	12.30
420077	AW512260	Hs.87767	ESTs	12.24
453930	AA419466	Hs.36727	hypothetical protein FLJ10903	12.22
441610	AW576148	Hs.148376	ESTs	12.20
451009	AA013140	Hs.115707	ESTs	12.18
433764	AW753676	Hs.39982	ESTs	12.16
440286	U29589	Hs.7138	cholinergic receptor, muscarinic 3	12.04
443912	R37257	Hs.184780	ESTs	11.92
419526	AI821895	Hs.193481	ESTs	11.91
423073	BE252922	Hs.123119	MAD (mothers against decapentaplegic, Dr	11.87
452784	BE463857	Hs.151258	hypothetical protein FLJ21062	11.86
414422	AA147224	Hs.71814	ESTs	11.76
450203	AF097994	Hs.301528	L-kynurenine/alpha-aminoadipate aminotra	11.68
436679	AI127483	Hs.120451	ESTs, Weakly similar to unnamed protein	11.60
440901	AA909358	Hs.128612	ESTs	11.60
448045	AJ297436	Hs.20166	prostate stem cell antigen	11.51
433887	AW204232	Hs.279522	ESTs	11.50
434980	AW770553	Hs.293640	sterol O-acyltransferase (acyl-Coenzyme	11.38
425905	AB032959	Hs.161700	novel C3HC4 type Zinc finger (ring finge	11.33
434680	T11738	Hs.127574	ESTs	11.32
449650	AF055575	Hs.297647	calcium channel, voltage-dependent, L ty	11.18
431173	AW971198	Hs.294068	ESTs	11.16
434539	AW748078	Hs.214410	ESTs, Weakly similar to MUC2_HUMAN MUCIN	11.16
410037	AB020725	Hs.58009	KIAA0918 protein	11.14
417708	N74392	Hs.50495	ESTs	11.14
458332	AI000341	Hs.220491	ESTs	11.12
420381	D50640	Hs.301782	phosphodiesterase 3B, cGMP-inhibited	11.10
425665	AK001050	Hs.159066	hypothetical protein FLJ10188	11.08
425710	AF030880	Hs.159275	solute carrier family, member 4	11.08
428728	NM_016625	Hs.191381	hypothetical protein	11.04
407021	U52077		gb:Human mariner1 transposase gene, comp	11.02
410733	D84284	Hs.66052	CD38 antigen (p45)	11.02
401714				10.90
434485	AI623511	Hs.118567	ESTs	10.89
415786	AW419196	Hs.257924	hypothetical protein FLJ13782	10.87
452340	NM_002202	Hs.505	ISL1 transcription factor, LIM/homeodoma	10.85
453628	AW243307	Hs.170187	hypothetical protein	10.72
408063	BE086548	Hs.42346	calcineurin-binding protein calsarcin-1	10.67
417687	AI828596	Hs.250691	ESTs	10.64
434666	AF151103	Hs.112259	T cell receptor gamma locus	10.53
432374	W68815	Hs.301885	Homo sapiens cDNA FLJ11346 fis, clone PL	10.50
428819	AL135623	Hs.193914	KIAA0575 gene product	10.48
413409	AI638418	Hs.21745	DEAD/H (Asp-Glu-Ala-Asp/His) box polypep	10.44
428775	AA434579	Hs.143691	ESTs	10.21
436556	AI364997	Hs.7572	ESTs	10.20
441690	R81733	Hs.33106	ESTs	10.14
419852	AW503756	Hs.286184	hypothetical protein dJ551D2.5	10.10
421991	NM_014918	Hs.110488	KIAA0990 protein	10.04
423698	AA329796	Hs.1098	DKFZp434J1813 protein	10.02
452039	AI922988	Hs.172510	ESTs	10.00
433043	W57554	Hs.125019	ESTs	9.98
433927	AI557019	Hs.116467	small nuclear protein PRAC	9.97
445424	AB028945	Hs.12696	cortactin SH3 domain-binding protein	9.96
432240	AI694767	Hs.129179	Homo sapiens cDNA FLJ13581 fis, clone PL	9.88
433104	AL043002	Hs.128246	ESTs, Moderately similar to unnamed prot	9.84
452744	AI267652	Hs.30504	Homo sapiens mRNA; cDNA DKFZp434E082 (fr	9.82
431217	NM_013427	Hs.250830	Rho GTPase activating protein 6	9.75
427398	AW390020	Hs.20415	chromosome 21 open reading frame 11	9.70
446896	T15767	Hs.22452	Homo sapiens mRNA for KIAA1737 protein,	9.70
421470	R27496	Hs.1378	annexin A3	9.64
406554				9.60
401424				9.58
407902	AL117474	Hs.41181	Homo sapiens mRNA; cDNA DKFZp727C191 (fr	9.56
423545	AP000692	Hs.129781	chromosome 21 open reading frame 5	9.54
439024	R96696	Hs.35598	ESTs	9.51
431548	AI834273	Hs.9711	novel protein	9.48
409262	AK000631	Hs.52256	hypothetical protein FLJ20624	9.45
446271	D82484	Hs.100469	ESTs	9.42
448692	AW013907	Hs.224276	methylcrotonoyl-Coenzyme A carboxylase 2	9.26

414140	AA281279	Hs.23317	hypothetical protein FLJ14681	9.24
435980	AF274571	Hs.129142	deoxyribonuclease II beta	9.24
421246	AW582962	Hs.300961	CGI-47 protein	9.20
427304	AA761526	Hs.163853	ESTs	9.16
442914	AW188551	Hs.99519	hypothetical protein FLJ14007	9.16
413627	BE182082	Hs.246973	ESTs	9.14
439699	AF086534	Hs.187561	ESTs, Moderately similar to ALU1_HUMAN A	9.10
437718	AI927288	Hs.198779	ESTs	9.07
439820	AL360204	Hs.283853	Homo sapiens mRNA full length insert cDN	9.06
447342	AI199268	Hs.19322	Homo sapiens, Similar to RIKEN cDNA 2010	9.05
446223	BE300091	Hs.119699	hypothetical protein FLJ12969	9.04
410001	AB041036	Hs.57771	kallikrein 11	9.03
424012	AW368377	Hs.137569	tumor protein 63 kDa with strong homolog	9.03
441791	AW372449	Hs.175982	hypothetical protein FLJ21159	9.02
448206	BE622585	Hs.3731	ESTs, Moderately similar to I38022 hypot	9.02
414269	AA298489		olfactory receptor, family 51, subfamily	8.99
442081	AA401863	Hs.22380	ESTs	8.98
420092	AA814043	Hs.88045	ESTs	8.85
411630	U42349	Hs.71119	Putative prostate cancer tumor suppresso	8.80
421863	AI952677	Hs.108972	Homo sapiens mRNA; cDNA DKFZp434P228 (fr	8.80
454141	AW138413	Hs.182356	ATP-binding cassette, sub-family C (CFTR	8.80
418278	AI088489	Hs.83937	hypothetical protein	8.78
428330	L22524	Hs.2256	matrix metalloproteinase 7 (matrilysin,	8.76
432415	T16971	Hs.289014	ESTs, Weakly similar to A43932 mucin 2 p	8.75
424906	AI566086	Hs.153716	Homo sapiens mRNA for Hmob33 protein, 3'	8.74
415245	N59650	Hs.27252	ESTs	8.72
442409	BE208843	Hs.129544	hypothetical protein MGC15438	8.70
404571				8.66
418033	W68180	Hs.259855	elongation factor-2 kinase	8.64
456497	AW967956	Hs.123648	ESTs, Weakly similar to AF108460 1 ubinu	8.56
405876				8.54
448807	AI571940	Hs.7549	ESTs	8.52
445372	N36417	Hs.144928	ESTs	8.48
425171	AW732240	Hs.300615	ESTs	8.44
419968	X04430	Hs.93913	interleukin 6 (interferon, beta 2)	8.36
407385	AA610150	Hs.272072	ESTs, Weakly similar to I38022 hypotheti	8.31
433172	AB037841	Hs.102652	hypothetical protein ASH1	8.30
422631	BE218919	Hs.118793	hypothetical protein FLJ10688	8.27
412719	AW016610	Hs.129911	ESTs	8.24
418849	AW474547	Hs.53565	Homo sapiens PIG-M mRNA for mannosyltran	8.22
444922	AI921750	Hs.144871	Homo sapiens cDNA FLJ13752 fis, clone PL	8.22
427674	NM_003528	Hs.2178	H2B histone family, member Q	8.20
432101	AI918950	Hs.11092	EphA3	8.17
416288	H51299		gb:yp07c06.s1 Soares breast 3NbHBst Homo	8.15
404915				8.08
440106	AA864968	Hs.127699	KIAA1603 protein	8.07
442861	AA243837	Hs.57787	ESTs	8.06
452259	AA317439	Hs.28707	signal sequence receptor, gamma (translo	8.06
443250	AI041530	Hs.132107	ESTs	8.06
437267	AW511443	Hs.258110	ESTs	8.04
452891	N75582	Hs.212875	ESTs, Weakly similar to DYH9_HUMAN CILI	8.02
422219	AW978073		regulator of mitotic spindle assembly 1	8.00
453049	BE537217	Hs.30343	ESTs	8.00
439731	AI953135	Hs.45140	hypothetical protein FLJ14084	7.98
408554	AA836381	Hs.7323	nuclear receptor co-repressor/HDAC3 comp	7.94
421154	AA284333	Hs.287631	Homo sapiens cDNA FLJ14269 fis, clone PL	7.94
430107	AA465293	Hs.105069	ESTs	7.94
433404	T32982	Hs.102720	ESTs	7.93
450813	AI739625	Hs.203376	ESTs	7.90
416239	AL038450	Hs.48948	ESTs	7.85
448212	AI475858		gb:tc87d07.x1 NCI_CGAP_CLL1 Homo sapiens	7.82
449532	W74653	Hs.271593	ESTs, Moderately similar to A47582 B-cel	7.82
413930	M86153	Hs.75618	RAB11A, member RAS oncogene family	7.80
458191	AI420611	Hs.127832	ESTs	7.80
444858	AI199738	Hs.208275	ESTs, Weakly similar to ALUA_HUMAN !!!!	7.78
457498	AI732230	Hs.191737	ESTs	7.78
407235	D20569	Hs.169407	SAC2 (suppressor of actin mutations 2, y	7.76
433759	AA680003	Hs.109363	Homo sapiens cDNA: FLJ23603 fis, clone L	7.74
433805	AA706910	Hs.112742	ESTs	7.74

426485	NM_006207	Hs.170040	platelet-derived growth factor receptor-	7.72
446028	R44714	Hs.106795	Homo sapiens cDNA FLJ13136 fis, clone NT	7.72
418555	AI417215	Hs.87159	hypothetical protein FLJ12577	7.70
447499	AW262580	Hs.147674	protocadherin beta 16	7.70
419839	U24577	Hs.93304	phospholipase A2, group VII (platelet-ac	7.68
416857	AA188775	Hs.292453	ESTs	7.68
413801	M62246	Hs.35406	ESTs, Highly similar to unnamed protein	7.66
425480	AB023198	Hs.158135	KIAA0981 protein	7.66
420120	AL049610	Hs.95243	transcription elongation factor A (SII)-	7.64
424099	AF071202	Hs.139336	ATP-binding cassette, sub-family C (CFTR	7.64
446307	T50083	Hs.9094	ESTs	7.63
429220	AW207206	Hs.136319	ESTs	7.59
420345	AW295230	Hs.25231	ESTs	7.54
429208	AA447990	Hs.190478	ESTs	7.54
447247	AW369351	Hs.287955	Homo sapiens cDNA FLJ13090 fis, clone NT	7.53
440995	T57773	Hs.10263	ESTs	7.53
448706	AW291095	Hs.21814	interleukin 20 receptor, alpha	7.52
410227	AB009284	Hs.61152	exostoses (multiple)-like 2	7.49
431616	AA508552	Hs.195839	ESTs, Weakly similar to I38022 hypotheti	7.46
434217	AW014795	Hs.23349	ESTs	7.44
431467	N71831	Hs.256398	Homo sapiens mRNA; cDNA DKFZp434E0528 (f	7.42
448519	AW175665	Hs.244334	Homo sapiens prostein mRNA, complete cds	7.42
446791	AI632278	Hs.34981	ESTs	7.40
419743	AW408762	Hs.127478	Homo sapiens clone 24416 mRNA sequence	7.39
445855	BE247129	Hs.145569	ESTs	7.36
425211	M18667	Hs.1867	progastricsin (pepsinogen C)	7.35
419131	AA406293	Hs.301622	ESTs	7.34
400294	N95796	Hs.179809	Homo sapiens prostein mRNA, complete cds	7.33
441736	AW292779	Hs.169799	ESTs	7.28
427701	AA411101	Hs.221750	nuclear autoantigenic sperm protein (his	7.24
457733	AW974812	Hs.291971	ESTs	7.24
418432	M14156	Hs.85112	insulin-like growth factor 1 (somatomedi	7.22
441201	AW118822	Hs.128757	ESTs	7.21
419953	BE267154	Hs.125752	ESTs	7.20
419991	AJ000098	Hs.94210	eyes absent (Drosophila) homolog 1	7.20
425018	BE245277	Hs.154196	E4F transcription factor 1	7.20
424560	AA158727	Hs.150555	protein predicted by clone 23733	7.18
435380	AA679001	Hs.192221	ESTs	7.14
420658	AW965215	Hs.130707	ESTs	7.12
408291	AB023191	Hs.44131	KIAA0974 protein	7.10
409110	AA191493	Hs.48778	niban protein	7.10
414485	W27026	Hs.182625	VAMP (vesicle-associated membrane protei	7.10
430039	BE253012	Hs.153400	ESTs, Weakly similar to ALU1_HUMAN ALU S	7.10
450832	AW970602	Hs.105421	ESTs	7.10
417153	X57010	Hs.81343	collagen, type II, alpha 1 (primary oste	7.08
412446	AI768015	Hs.92127	ESTs	7.07
412953	Z45794	Hs.238809	ESTs	7.06
418051	AW192535	Hs.19479	ESTs	7.06
421566	NM_000399	Hs.1395	early growth response 2 (Krox-20 (Drosop	7.04
446999	AA151520	Hs.279525	hypothetical protein MGC4485	7.04
440529	AW207640	Hs.16478	Homo sapiens cDNA: FLJ21718 fis, clone C	7.04
441111	AI806867	Hs.126594	ESTs	7.01
451027	AW519204	Hs.40808	ESTs	7.00
408432	AW195262		gb:xn67b05.x1 NCI_CGAP_CML1 Homo sapiens	7.00
432223	AA333283	Hs.285336	Homo sapiens, clone IMAGE:3460280, mRNA	7.00
444805	AB007899	Hs.12017	homolog of yeast ubiquitin-protein ligas	6.99
414212	AA136569	Hs.295940	KIAA0187 gene product	6.98
431725	X65724	Hs.2839	Norrie disease (pseudoglioma)	6.98
449685	AW296669	Hs.66095	ESTs	6.97
447313	U92981	Hs.18081	Homo sapiens clone DT1P1B6 mRNA, CAG rep	6.96
424590	AW966399	Hs.46821	hypothetical protein FLJ20086	6.94
449655	AI021987	Hs.59970	ESTs	6.92
419563	AA526235	Hs.193162	Homo sapiens cDNA FLJ11983 fis, clone HE	6.90
434163	AW974720	Hs.25206	group XII secreted phospholipase A2	6.89
415809	Z32789	Hs.46601	ESTs	6.86
425782	U66468	Hs.159525	cell growth regulatory with EF-hand doma	6.85
417958	AA767382	Hs.193417	ESTs	6.84
427408	AA583206	Hs.2156	RAR-related orphan receptor A	6.79
445873	AA250970	Hs.251946	poly(A)-binding protein, cytoplasmic 1-l	6.74

410718	AI920783	Hs.191435	ESTs	6.74
432363	AA534489		gb:nf76g11.s1 NCI_CGAP_Co3 Homo sapiens	6.74
436521	AW203986	Hs.213003	ESTs	6.73
435604	AA625279	Hs.26892	uncharacterized bone marrow protein BM04	6.73
419083	AI479560	Hs.98613	Homo sapiens cDNA FLJ12292 fis, clone MA	6.72
418245	AA088767	Hs.83883	transmembrane, prostate androgen induced	6.70
420714	BE172704	Hs.222746	KIAA1610 protein	6.70
412707	AW206373	Hs.16443	Homo sapiens cDNA: FLJ21721 fis, clone C	6.67
421896	N62293	Hs.45107	ESTs	6.66
411078	AI222020	Hs.182364	CocoaCrisp	6.66
452465	AA610211	Hs.34244	ESTs	6.66
422763	AA033699	Hs.83938	ESTs, Moderately similar to MAS2_HUMAN M	6.66
444618	AV653785	Hs.300171	ELL-RELATED RNA POLYMERASE II, ELONGATIO	6.64
450164	AI239923	Hs.30098	ESTs	6.63
431060	AF039307	Hs.249171	homeo box A11	6.62
408031	AA081395	Hs.42173	Homo sapiens cDNA FLJ10366 fis, clone NT	6.62
420285	AA258124	Hs.293878	ESTs, Moderately similar to ZN91_HUMAN Z	6.62
444670	H58373	Hs.37494	hypothetical protein MGC5370	6.62
444489	AI151010	Hs.157774	ESTs	6.60
445685	AW779829	Hs.263436	gb:hn88a05.x1 NCI_CGAP_Kid11 Homo sapien	6.60
435677	AA694142	Hs.293726	ESTs, Weakly similar to TSGA RAT TESTIS	6.59
452221	C21322	Hs.11577	hypothetical protein FLJ22242	6.59
431510	AA580082	Hs.112264	ESTs	6.56
415874	AF091622	Hs.78893	KIAA0244 protein	6.54
418405	AI868282	Hs.11898	ESTs, Highly similar to KIAA1370 protein	6.54
452768	AW069459	Hs.61539	ESTs	6.54
401451				6.52
416289	W26333		ESTs	6.52
431778	AL080276	Hs.268562	regulator of G-protein signalling 17	6.51
409089	NM_014781	Hs.50421	KIAA0203 gene product	6.50
442833	AA328153	Hs.88201	ESTs, Weakly similar to A Chain A, Cryst	6.50
431992	NM_002742	Hs.2891	protein kinase C, mu	6.49
418833	AW974899	Hs.292776	ESTs	6.48
429163	AA884766		gb:am20a10.s1 Soares_NFL_T_GBC_S1 Homo s	6.46
430403	AF039390	Hs.241382	tumor necrosis factor (ligand) superfami	6.46
443058	AW451642	Hs.16732	ESTs	6.46
418584	AA631143	Hs.179809	Homo sapiens prostein mRNA, complete cds	6.44
432674	AA641092	Hs.257339	ESTs, Weakly similar to I38022 hypotheti	6.44
423600	AI633559	Hs.29076	ESTs	6.44
404253				6.42
433610	AA806822	Hs.112547	ESTs	6.42
421552	AF026692	Hs.105700	secreted frizzled-related protein 4	6.41
407118	AA156790	Hs.262036	ESTs, Weakly similar to Z223_HUMAN ZINC	6.40
408608	N79738	Hs.136102	KIAA0853 protein	6.40
421452	AI925946	Hs.104530	fetal hypothetical protein	6.40
433285	AW975944	Hs.237396	ESTs	6.40
434926	BE543269	Hs.50252	mitochondrial ribosomal protein L32	6.40
446189	H85224	Hs.214013	ESTs	6.40
416806	NM_000288	Hs.79993	peroxisomal biogenesis factor 7	6.38
416467	H57585	Hs.37467	ESTs	6.36
453403	BE466639	Hs.61779	Homo sapiens cDNA FLJ13591 fis, clone PL	6.34
429769	NM_004917	Hs.218366	kallikrein 4 (prostase, enamel matrix, p	6.34
423642	AW452650	Hs.157148	hypothetical protein MGC13204	6.32
425843	BE313280	Hs.159627	death associated protein 3	6.32
439221	AA737106	Hs.32250	ESTs, Moderately similar to I78885 serin	6.32
428194	AA765603	Hs.180877	H3 histone, family 3B (H3.3B)	6.30
431958	X63629	Hs.2877	cadherin 3, type 1, P-cadherin (placenta	6.30
439366	AF100143	Hs.6540	fibroblast growth factor 13	6.30
452789	AW081626	Hs.242561	ESTs	6.30
416836	D54745	Hs.80247	cholecystokinin	6.30
436962	AW377314	Hs.5364	DKFZP564I052 protein	6.29
433383	AF034837	Hs.192731	double-stranded RNA specific adenosine d	6.29
418636	AW749855		gb:QV4-BT0534-281299-053-c05 BT0534 Homo	6.26
450728	AW162923	Hs.25363	presenilin 2 (Alzheimer disease 4)	6.25
440293	AI004193	Hs.22123	ESTs	6.24
453745	AA952989	Hs.63908	hypothetical protein MGC14726	6.24
426595	AW971980	Hs.62402	p21/Cdc42/Rac1-activated kinase 1 (yeast	6.24
444412	AI147652	Hs.216381	Homo sapiens clone HH409 unknown mRNA	6.24
413384	NM_000401	Hs.75334	exostoses (multiple) 2	6.22

426320	W47595	Hs.169300	transforming growth factor, beta 2	6.22
423349	AF010258	Hs.127428	homeo box A9	6.20
429165	AW009886	Hs.118258	prostate cancer associated protein 1	6.18
424800	AL035588	Hs.153203	MyoD family inhibitor	6.18
409564	AA045857	Hs.54943	fracture callus 1 (rat) homolog	6.16
438796	W67821	Hs.109590	genethonin 1	6.16
425451	AF242769	Hs.157461	mesenchymal stem cell protein DSC54	6.14
451663	AI872360	Hs.209293	ESTs	6.14
413623	AA825721	Hs.246973	ESTs	6.12
452232	AW020603	Hs.271698	radial spoke protein 3	6.12
453390	AA862496	Hs.28482	ESTs	6.12
435542	AA687376	Hs.269533	ESTs	6.12
420424	AB033036	Hs.97594	KIAA1210 protein	6.11
407103	AA424881	Hs.256301	hypothetical protein MGC13170	6.10
409734	BE161684	Hs.56155	hypothetical protein	6.10
432686	BE223007	Hs.152460	Homo sapiens cDNA FLJ12909 fis, clone NT	6.10
438361	AA805666	Hs.146217	Homo sapiens cDNA: FLJ23077 fis, clone L	6.10
411479	AW848047		gb:IL3-CT0214-291299-052-A12 CT0214 Homo	6.10
438849	W28948	Hs.10762	ESTs	6.08
452726	AF188527	Hs.61661	ESTs, Weakly similar to AF174605 1 F-box	6.08
445895	D29954	Hs.13421	KIAA0056 protein	6.08
440774	AI420611	Hs.127832	ESTs	6.07
422583	AA410508	Hs.118578	KIAA0874 protein	6.06
427500	AW970017	Hs.293948	ESTs, Weakly similar to S65657 alpha-1C-	6.04
443646	AI085198	Hs.298699	ESTs	6.04
410566	AA373210	Hs.43047	Homo sapiens cDNA FLJ13585 fis, clone PL	6.02
417845	AL117461	Hs.82719	Homo sapiens mRNA; cDNA DKFZp586F1822 (f	6.02
430273	AI311127	Hs.125522	ESTs	6.02
434792	AA649253	Hs.132458	ESTs	6.01
442490	AW965078	Hs.30212	thyroid receptor interacting protein 15	6.01
420026	AI831190	Hs.166676	ESTs	6.00
437782	AI370876	Hs.123163	exportin 1 (CRM1, yeast, homolog)	6.00
447359	NM_012093	Hs.18268	adenylate kinase 5	6.00
447713	AI420733	Hs.207083	ESTs	6.00
451073	AI758905	Hs.206063	ESTs	6.00
451640	AA195601	Hs.26771	Human DNA sequence from clone 747H23 on	6.00
410889	X91662	Hs.66744	twist (Drosophila) homolog (acrocephalos	5.97
441222	AI277237	Hs.44208	hypothetical protein FLJ23153	5.96
447732	AI758398	Hs.161318	ESTs	5.96
437756	AA767537	Hs.197096	ESTs	5.95
408829	NM_006042	Hs.48384	heparan sulfate (glucosamine) 3-O-sulfot	5.94
453911	AW503857	Hs.4007	Sarcolemmal-associated protein	5.94
414085	AA114016	Hs.75746	aldehyde dehydrogenase 1 family, member	5.93
408875	NM_015434	Hs.48604	DKFZP434B168 protein	5.92
439451	AF086270	Hs.278554	heterochromatin-like protein 1	5.92
423853	AB011537	Hs.133466	slit (Drosophila) homolog 1	5.91
453060	AW294092	Hs.21594	hypothetical protein MGC15754	5.91
420407	AA814732	Hs.145010	lipopolysaccaride-specific response 5-li	5.91
450480	X82125	Hs.25040	zinc finger protein 239	5.90
408446	AW450669	Hs.45068	hypothetical protein DKFZp434I143	5.88
421039	NM_003478	Hs.101299	cullin 5	5.88
451684	AF216751	Hs.26813	CDA14	5.88
436063	AK000028	Hs.250867	ribosomal protein S24	5.86
410507	AA355288	Hs.271408	transitional epithelia response protein	5.86
420179	N74530	Hs.21168	ESTs	5.84
453878	AW964440	Hs.19025	DC32	5.84
452270	AW975014	Hs.26	ferrochelatase (protoporphyria)	5.83
435867	AA954229	Hs.114052	ESTs	5.82
417683	AW566008	Hs.239154	ankyrin repeat, family A (RFXANK-like),	5.82
432005	AA524190	Hs.120777	ESTs, Weakly similar to ELL2_HUMAN RNA P	5.81
406815	AA833930	Hs.288036	tRNA isopentenylpyrophosphate transferas	5.80
437980	R50393	Hs.278436	KIAA1474 protein	5.80
425856	AA364908	Hs.98927	hypothetical protein FLJ13993	5.79
400301	X03635	Hs.1657	estrogen receptor 1	5.78
446261	AA313893	Hs.13399	hypothetical protein FLJ12615 similar to	5.78
410141	R07775	Hs.287657	Homo sapiens cDNA: FLJ21291 fis, clone C	5.77
427258	AA400091	Hs.39421	ESTs	5.76
419108	AA389724	Hs.191264	ESTs, Weakly similar to ALU7_HUMAN ALU S	5.76
442029	AW956698	Hs.14456	neural precursor cell expressed, develop	5.76

407783	AW996872	Hs.172028	a disintegrin and metalloproteinase doma	5.75
434408	AI031771	Hs.132586	ESTs	5.74
415077	L41607	Hs.934	glucosaminyl (N-acetyl) transferase 2, I	5.74
432435	BE218886	Hs.282070	ESTs	5.74
433313	W20128	Hs.296039	ESTs	5.73
431740	N75450	Hs.183412	ESTs, Moderately similar to AF116721 67	5.73
412991	AW949013		gb:QV4-FT0005-110500-201-e12 FT0005 Homo	5.72
418852	BE537037	Hs.273294	hypothetical protein FLJ20069	5.72
418882	NM_004996	Hs.89433	ATP-binding cassette, sub-family C (CFTR	5.72
446887	AB007891	Hs.16349	KIAA0431 protein	5.72
437866	AA156781	Hs.83992	metallothionein 1E (functional)	5.72
410232	AW372451	Hs.61184	CGI-79 protein	5.70
414452	AA454038	Hs.29032	ESTs	5.70
422762	AL031320	Hs.119976	Human DNA sequence from clone RP1-20N2 o	5.70
428730	AA625947	Hs.25750	ESTs	5.70
431571	AW500486	Hs.180610	splicing factor proline/glutamine rich (	5.70
433393	AF038564	Hs.98074	itchy (mouse homolog) E3 ubiquitin prote	5.70
450816	AL133067	Hs.25214	hypothetical protein	5.70
443774	AL117428	Hs.9740	DKFZP434A236 protein	5.69
446100	AW967109	Hs.13804	hypothetical protein dJ462O23.2	5.69
419168	AI336132	Hs.33718	Homo sapiens cDNA FLJ12641 fis, clone NT	5.68
416653	AA768553	Hs.77496	metallothionein 1E (functional)	5.67
452679	Z42387	Hs.4299	transmembrane, prostate androgen induced	5.66
450244	AA007534	Hs.125062	ESTs	5.66
408621	AI970672	Hs.46638	chromosome 11 open reading frame 8	5.65
450325	AI935962	Hs.26289	ESTs	5.65
439671	AW162840	Hs.6641	kinesin family member 5C	5.64
452387	AI680772	Hs.4316	trinucleotide repeat containing 12	5.64
413992	W26276	Hs.136075	RNA, U2 small nuclear	5.63
444151	AW972917	Hs.128749	alpha-methylacyl-CoA racemase	5.63
417791	AW965339	Hs.111471	ESTs	5.62
410186	AI936442	Hs.59838	hypothetical protein FLJ10808	5.60
415123	D60925		ESTs	5.60
429170	NM_001394	Hs.2359	dual specificity phosphatase 4	5.60
434415	BE177494		gb:RC6-HT0598-270300-011-C05 HT0596 Homo	5.60
440738	AI004650	Hs.225674	WD repeat domain 9	5.60
443830	AI142095	Hs.143273	ESTs	5.60
449603	AI655662	Hs.197698	ESTs	5.60
414342	AA742181	Hs.75912	KIAA0257 protein	5.59
422634	NM_016010	Hs.118821	CGI-62 protein	5.56
435047	AA454985	Hs.54973	cadherin-like protein VR20	5.55
400268				5.55
452055	AI377431	Hs.293772	hypothetical protein MGC10858	5.54
437073	AI885608	Hs.94122	ESTs	5.54
434072	H70854	Hs.283059	Homo sapiens PRO1082 mRNA, complete cds	5.53
418339	AA639902	Hs.104215	ESTs, Moderately similar to SPCN_HUMAN S	5.52
434551	BE387162	Hs.280858	ESTs, Highly similar to A35661 DNA excis	5.52
439569	AW602166	Hs.222399	CEGP1 protein	5.51
441102	AA973905	Hs.16003	intermediate filament protein syncoilin	5.50
448310	AI480316		gb:tm26h09.x1 Soares_NFL_T_GBC_S1 Homo s	5.50
413173	BE076928	Hs.70980	ESTs	5.48
436246	AW450963	Hs.119991	ESTs	5.48
449300	AI656959	Hs.222165	ESTs	5.48
452823	AB012124	Hs.30696	transcription factor-like 5 (basic helix	5.48
451403	AA885569	Hs.15727	Homo sapiens cDNA FLJ14511 fis, clone NT	5.46
417061	AI675944	Hs.188691	Homo sapiens cDNA FLJ12033 fis, clone HE	5.44
429126	AW172356	Hs.99083	ESTs	5.44
431316	AA502663	Hs.145037	ESTs	5.44
439192	AW970536	Hs.105413	ESTs	5.44
431938	AA938471	Hs.115242	specific granule protein (28 kDa); cyste	5.44
451552	AA047233	Hs.33810	ESTs	5.43
416991	N36389	Hs.295091	KIAA0226 gene product	5.42
427638	AA406411	Hs.208341	ESTs, Weakly similar to KIAA0989 protein	5.42
427718	AI798680	Hs.25933	ESTs	5.42
438710	AA833907	Hs.178724	ESTs, Weakly similar to ALU1_HUMAN ALU S	5.42
406076	AL390179	Hs.137011	Homo sapiens mRNA; cDNA DKFZp547P134 (fr	5.40
431263	AW129203	Hs.13743	ESTs	5.40
421264	AL039123	Hs.103042	microtubule-associated protein 1B	5.38
421685	AF189723	Hs.106778	ATPase, Ca++ transporting, type 2C, memb	5.37

408460	AA054726	Hs.285574	ESTs	5.36
409091	AW970386	Hs.269423	ESTs	5.36
421987	AI133161	Hs.286131	CGI-101 protein	5.36
428002	AA418703		gb:zv98c03.s1 Soares_NhHMPu_S1 Homo sapi	5.36
441217	AI922183	Hs.213246	ESTs	5.36
426006	R49031	Hs.22627	ESTs	5.35
422806	BE314767	Hs.1581	glutathione S-transferase theta 2	5.34
432281	AK001239	Hs.274263	hypothetical protein FLJ10377	5.32
451982	F13036	Hs.27373	Homo sapiens mRNA; cDNA DKFZp564O1763 (f	5.32
421129	BE439899	Hs.89271	ESTs	5.31
444042	NM_004915	Hs.10237	ATP-binding cassette, sub-family G (WHIT	5.31
410150	AW382942	Hs.6774	ESTs	5.30
423952	AW877787	Hs.136102	KIAA0853 protein	5.30
452822	X85689	Hs.288617	hypothetical protein FLJ22621	5.30
447752	M73700	Hs.347	lactotransferrin	5.29
441766	R53790	Hs.23294	hypothetical protein FLJ14393	5.29
431359	AW993522	Hs.292934	ESTs	5.27
427212	AW293849	Hs.58279	ESTs, Weakly similar to ALU7_HUMAN ALU S	5.27
449916	T60525	Hs.299221	pyruvate dehydrogenase kinase, isoenzyme	5.27
454014	AW016670	Hs.233275	ESTs	5.27
419714	AA758751	Hs.98216	ESTs	5.26
428845	AL157579	Hs.153610	KIAA0751 gene product	5.26
417333	AL157545	Hs.42179	bromodomain and PHD finger containing, 3	5.24
419986	AI345455	Hs.78915	GA-binding protein transcription factor,	5.24
407182	AA312551	Hs.230157	ESTs	5.22
420111	AA255652		gb:zs21h11.r1 NCI_CGAP_GCB1 Homo sapiens	5.22
428058	AI821625	Hs.191602	ESTs	5.22
459551	AI472808		gb:tj70e07.x1 Soares_NSF_F8_9W_OT_PA_P_S	5.22
432524	AI458020	Hs.293287	ESTs	5.22
436207	AA334774	Hs.12845	hypothetical protein MGC13159	5.22
410870	U81599	Hs.66731	homeo box B13	5.22
451418	BE387790	Hs.26369	hypothetical protein FLJ20287	5.22
409757	NM_001898	Hs.123114	cystatin SN	5.21
441124	T97717	Hs.119563	ESTs	5.21
428593	AW207440	Hs.185973	degenerative spermatocyte (homolog Droso	5.21
436401	AI087958	Hs.29088	ESTs	5.20
437113	AA744693		gb:ny26c10.s1 NCI_CGAP_GCB1 Homo sapiens	5.20
450947	AI745400	Hs.204662	ESTs	5.20
453279	AW893940	Hs.59698	ESTs	5.20
445467	AI239832	Hs.15617	ESTs, Weakly similar to ALU4_HUMAN ALU S	5.19
448944	AB014605	Hs.22599	atrophin-1 interacting protein 1; activi	5.19
412198	AA937111	Hs.69165	ESTs	5.18
422646	H87863	Hs.151380	ESTs, Weakly similar to T16584 hypotheti	5.18
438986	AF085888	Hs.269307	ESTs	5.18
453954	AW118338	Hs.75251	DEAD/H (Asp-Glu-Ala-Asp/His) box binding	5.18
447541	AK000288	Hs.18800	hypothetical protein FLJ20281	5.18
434029	AA621763	Hs.170434	Homo sapiens cDNA FLJ14242 fis, clone OV	5.16
459294	AW977286	Hs.169531	RBP1-like protein	5.16
429441	AJ224172	Hs.204096	lipophilin B (uteroglobin family member)	5.16
424692	AA429834	Hs.151791	KIAA0092 gene product	5.15
427359	AW020782	Hs.79881	Homo sapiens cDNA: FLJ23006 fis, clone L	5.15
419872	AI422951	Hs.146162	ESTs	5.15
429422	AK001494	Hs.202596	Homo sapiens cDNA FLJ10632 fis, clone NT	5.14
448902	Z45998	Hs.22543	Homo sapiens mRNA; cDNA DKFZp761I1912 (f	5.14
459055	N23235	Hs.30567	ESTs, Weakly similar to B34087 hypotheti	5.14
431318	AA502700	Hs.293147	ESTs, Moderately similar to A46010 X-lin	5.14
452953	AI932884	Hs.271741	ESTs, Weakly similar to A46010 X-linked	5.13
428372	AK000684	Hs.183887	hypothetical protein FLJ22104	5.12
434401	AI864131	Hs.71119	Putative prostate cancer tumor suppresso	5.12
416434	AW163045	Hs.79334	nuclear factor, interleukin 3 regulated	5.11
410268	AA316181	Hs.61635	six transmembrane epithelial antigen of	5.10
417517	AF001176	Hs.82238	POP4 (processing of precursor, S. cerev	5.10
453616	NM_003462	Hs.33846	dynein, axonemal, light intermediate pol	5.10
427958	AA418000	Hs.98280	potassium intermediate/small conductance	5.09
407945	X69208	Hs.606	ATPase, Cu++ transporting, alpha polypep	5.08
425154	NM_001851	Hs.154850	collagen, type IX, alpha 1	5.08
412863	AA121673	Hs.59757	zinc finger protein 281	5.06
420807	AA280627	Hs.57846	ESTs	5.06
430588	AA769221	Hs.270847	delta-tubulin	5.06

433687	AA743991		gb:ny57g01.s1 NCI_CGAP_Pr18 Homo sapiens	5.06
438375	AW015940	Hs.232234	ESTs	5.06
418092	R45154	Hs.106604	ESTs	5.06
418576	AW968159	Hs.289104	Alu-binding protein with zinc finger dom	5.05
413328	Y15723	Hs.75295	guanylate cyclase 1, soluble, alpha 3	5.04
414271	AK000275	Hs.75871	protein kinase C binding protein 1	5.04
432729	AK000292	Hs.278732	hypothetical protein FLJ20285	5.04
433433	AI692623	Hs.121513	Homo sapiens clone Z'3-1 placenta expres	5.04
439662	H97552	Hs.269060	ESTs	5.04
439743	AL389956	Hs.283858	Homo sapiens mRNA full length insert cDN	5.04
417511	AL049176	Hs.82223	chordin-like	5.02
437814	AI088192	Hs.135474	ESTs, Weakly similar to DDX9_HUMAN ATP-D	5.02
426342	AF093419	Hs.169378	multiple PDZ domain protein	5.02
429782	NM_005754	Hs.220689	Ras-GTPase-activating protein SH3-domain	5.02
429975	AI167145	Hs.165538	ESTs	5.02
436209	AW850417	Hs.254020	ESTs, Moderately similar to unnamed prot	5.02
438571	AW020775	Hs.56022	ESTs	5.02
450223	AA418204	Hs.241493	natural killer-tumor recognition sequenc	5.02
408267	AW380525	Hs.267705	tubulin-specific chaperone e	5.01
417730	Z44761		gb:HSC28F061 normalized infant brain cDN	5.00
425465	L18964	Hs.1904	protein kinase C, iota	5.00
430599	NM_004855	Hs.247118	phosphatidylinositol glycan, class B	5.00
450961	AW978813	Hs.250867	metallothionein 1E (functional)	5.00
451386	AB029006	Hs.26334	spastic paraplegia 4 (autosomal dominant	5.00
420380	AA640891	Hs.102406	ESTs	4.99
424947	R77952	Hs.239625	ESTs, Weakly similar to alternatively sp	4.99
442653	BE269247	Hs.170226	gb:601185486F1 NIH_MGC_8 Homo sapiens cD	4.98
457211	AW972565	Hs.32399	ESTs, Weakly similar to S51797 vasodilat	4.97
425851	NM_001490	Hs.159642	glucosaminyl (N-acetyl) transferase 1, c	4.97
446279	AA490770	Hs.182382	ESTs	4.96
433377	AI752713	Hs.43845	ESTs	4.96
450218	R02018	Hs.168640	ankylosis, progressive (mouse) homolog	4.96
412715	NM_000947	Hs.74519	primase, polypeptide 2A (58kD)	4.94
448164	R61680	Hs.26904	ESTs, Moderately similar to Z195_HUMAN Z	4.94
420121	AW968271	Hs.191534	ESTs, Weakly similar to ALU1_HUMAN ALU S	4.94
421689	N87820	Hs.106826	KIAA1696 protein	4.93
445808	AV655234	Hs.298083	ESTs, Moderately similar to PC4259 ferri	4.92
416533	BE244053	Hs.79362	retinoblastoma-like 2 (p130)	4.92
418049	AA211467	Hs.190488	Homo sapiens, Similar to nuclear localiz	4.92
436039	AW023323	Hs.121070	ESTs	4.92
432653	N62096	Hs.293185	ESTs, Weakly similar to JC7328 amino aci	4.91
420324	AF163474	Hs.96744	prostate androgen-regulated transcript 1	4.91
403047				4.91
436899	AA764852	Hs.291567	ESTs	4.90
431117	AF003522	Hs.250500	delta (Drosophila)-like 1	4.90
427617	D42063	Hs.179825	RAN binding protein 2	4.88
428804	AK000713	Hs.193736	hypothetical protein FLJ20706	4.88
433050	AI093930	Hs.163440	Homo sapiens cDNA: FLJ21000 fis, clone C	4.88
418575	AA225313	Hs.222886	ESTs, Weakly similar to TRHY_HUMAN TRICH	4.86
432615	AA557191	Hs.55028	ESTs, Weakly similar to I54374 gene NF2	4.86
412652	AI801777	Hs.6774	ESTs	4.86
432473	AI202703	Hs.152414	ESTs	4.86
449071	NM_005872	Hs.22960	breast carcinoma amplified sequence 2	4.86
450654	AJ245587	Hs.25275	Kruppel-type zinc finger protein	4.85
418866	T65754	Hs.100489	gb:yc11c07.s1 Stratagene lung (937210) H	4.85
407596	R86913		gb:yq30f05.r1 Soares fetal liver spleen	4.84
456516	BE172704	Hs.222746	KIAA1610 protein	4.84
426501	AW043782	Hs.293616	ESTs	4.84
448730	AB032983	Hs.21894	KIAA1157 protein	4.84
458339	AW976853	Hs.172843	ESTs	4.83
422083	NM_001141	Hs.111256	arachidonate 15-lipoxygenase, second typ	4.82
420159	AI572490	Hs.99785	Homo sapiens cDNA: FLJ21245 fis, clone C	4.82
424103	NM_001918	Hs.139410	dihydrolipoamide branched chain transacy	4.82
449535	W15267	Hs.23672	low density lipoprotein receptor-related	4.82
422048	NM_012445	Hs.288126	spondin 2, extracellular matrix protein	4.82
416737	AF154335	Hs.79691	LIM domain protein	4.82
419972	AL041465	Hs.294038	golgin-67	4.81
420235	AA256756	Hs.31178	ESTs	4.81
423412	AF109300	Hs.147924	prostate cancer associated protein 5	4.80

429598	AA811257	Hs.269710	ESTs	4.80
457114	AI821625	Hs.191602	ESTs	4.80
421828	AW891965	Hs.289109	histone deacetylase 3	4.79
424602	AK002055	Hs.301129	hypothetical protein FLJ11193	4.78
428364	AA426565	Hs.160541	ESTs, Moderately similar to ALU1_HUMAN A	4.78
452335	AW188944	Hs.61272	ESTs	4.78
410765	AI694972	Hs.68180	nucleosome assembly protein 1-like 2	4.77
421040	AA715026	Hs.135280	ESTs	4.76
421518	AI056392	Hs.208819	ESTs	4.76
452560	BE077084		ESTs	4.76
409752	AW983990		gb:EST376063 MAGE resequences, MAGH Homo	4.75
439703	AF086538	Hs.196245	ESTs	4.75
418836	AI655499	Hs.161712	ESTs	4.74
450642	R39773	Hs.7130	copine IV	4.74
419879	Z17805	Hs.93564	Homer, neuronal immediate early gene, 2	4.74
411440	AW749402		gb:QV4-BT0383-281299-061-c06 BT0383 Homo	4.74
450649	NM_001429	Hs.297722	E1A binding protein p300	4.74
408738	NM_014785	Hs.47313	KIAA0258 gene product	4.73
435020	AW505076	Hs.301855	DiGeorge syndrome critical region gene 8	4.72
411624	BE145964		KIAA0594 protein	4.72
439360	AA448488	Hs.55346	ribosomal protein L44	4.72
440491	R35252	Hs.24944	ESTs, Weakly similar to 2109260A B cell	4.72
442611	BE077155	Hs.177537	hypothetical protein DKFZp761B1514	4.72
443555	N71710	Hs.21398	ESTs, Moderately similar to A Chain A, H	4.72
453800	BE300741	Hs.288416	hypothetical protein FLJ13340	4.72
457528	AW973791	Hs.292784	ESTs	4.72
416795	AI497778	Hs.168053	HBV pX associated protein-8	4.71
407302	R74206	Hs.268755	ESTs, Weakly similar to I78885 serine/th	4.71
404721				4.70
426261	AW242243	Hs.168670	peroxisomal farnesylated protein	4.70
431924	AK000850	Hs.272203	Homo sapiens cDNA FLJ20843 fis, clone AD	4.70
435256	AF193766	Hs.13872	cytokine-like protein C17	4.70
438295	AI394151	Hs.37932	ESTs	4.70
442655	AW027457	Hs.30323	ESTs, Weakly similar to B34087 hypotheti	4.70
415788	AW628686	Hs.78851	KIAA0217 protein	4.69
442760	BE075297	Hs.10067	ESTs, Weakly similar to A43932 mucin 2 p	4.69
432432	AA541323	Hs.115831	ESTs	4.68
454398	AA463437	Hs.11556	Homo sapiens cDNA FLJ12566 fis, clone NT	4.68
452741	BE392914	Hs.30503	Homo sapiens cDNA FLJ11344 fis, clone PL	4.67
424853	BE549737	Hs.132967	Human EST clone 122887 mariner transposo	4.67
419706	C04649	Hs.77899	tropomyosin 1 (alpha)	4.66
412088	AI689496	Hs.108932	ESTs	4.65
416276	U41060	Hs.79136	LIV-1 protein, estrogen regulated	4.64
429281	AA830856	Hs.29808	Homo sapiens cDNA: FLJ21122 fis, clone C	4.64
448207	AI475490	Hs.170577	ESTs	4.64
408374	AW025430	Hs.155591	forkhead box F1	4.64
447162	BE328091	Hs.157396	ESTs, Weakly similar to A46010 X-linked	4.64
451900	AB023199	Hs.27207	KIAA0982 protein	4.63
421437	AW821252	Hs.104336	hypothetical protein	4.63
418624	AI734080	Hs.104211	ESTs	4.63
426172	AA371307	Hs.125056	ESTs	4.62
439831	AW136488	Hs.25545	ESTs	4.61
452994	AW962597	Hs.31305	KIAA1547 protein	4.61
457726	AI217477	Hs.194591	ESTs	4.60
434629	AA789081	Hs.4029	glioma-amplified sequence-41	4.60
403764				4.58
410659	AI080175	Hs.68826	ESTs	4.58
432383	AK000144	Hs.274449	Homo sapiens cDNA FLJ20137 fis, clone CO	4.58
451246	AW189232	Hs.39140	cutaneous T-cell lymphoma tumor antigen	4.58
433234	AB040928	Hs.65366	KIAA1495 protein	4.57
424983	AI742434	Hs.169911	ESTs	4.56
437812	AI582291	Hs.16846	ESTs, Weakly similar to O4HUD1 debrisoqu	4.56
438447	AI082883	Hs.167593	hypothetical protein FLJ13409; KIAA1711	4.55
434715	BE005346	Hs.116410	ESTs	4.55
447673	AI823987	Hs.182285	ESTs	4.54
408897	N50204	Hs.283709	lipopolysaccharide specific response-7 p	4.54
436645	AW023424	Hs.156520	ESTs	4.54
421247	BE391727	Hs.102910	general transcription factor IIH, polype	4.53
450377	AB033091	Hs.24936	KIAA1265 protein	4.53

433644	AW342028	Hs.256112	gb:hb75d03.x1 NCI_CGAP_Ut2 Homo sapiens	4.53
408321	AW405882	Hs.44205	cortistatin	4.53
439225	AA192669	Hs.45032	ESTs	4.52
440348	AW015802	Hs.47023	ESTs	4.52
446351	AW444551	Hs.258532	x 001 protein	4.52
451212	AW902672	Hs.287334	ESTs	4.52
430294	AI538226	Hs.135184	guanine nucleotide binding protein 4	4.52
435005	U80743	Hs.4316	trinucleotide repeat containing 12	4.52
448072	AI459306	Hs.24908	ESTs	4.50
403721				4.50
451018	AW965599	Hs.247324	mitochondrial ribosomal protein S14	4.50
453070	AK001465	Hs.31575	SEC63, endoplasmic reticulum translocon	4.49
417412	X16896	Hs.82112	interleukin 1 receptor, type I	4.48
439735	AI635386	Hs.142846	hypothetical protein	4.48
435663	AI023707	Hs.134273	ESTs	4.48
424036	AA770688	Hs.81946	H2A histone family, member L	4.48
426386	AA748850	Hs.174877	bladder cancer overexpressed protein	4.48
408622	AA056060	Hs.202577	Homo sapiens cDNA FLJ12166 fis, clone MA	4.47
444269	AI590346	Hs.146220	ESTs	4.47
430187	AI799909	Hs.158989	ESTs	4.46
427761	AA412205	Hs.140996	ESTs	4.46
430261	AA305127	Hs.237225	hypothetical protein HT023	4.46
444169	AV648170	Hs.58756	ESTs	4.44
430598	AK001764	Hs.247112	hypothetical protein FLJ10902	4.44
412903	BE007967	Hs.155795	ESTs	4.44
417048	AI088775	Hs.55498	geranylgeranyl diphosphate synthase 1	4.44
442710	AI015631	Hs.23210	ESTs	4.44
457413	AA743462	Hs.165337	ESTs	4.44
400303	AA242758	Hs.79136	LIV-1 protein, estrogen regulated	4.42
443268	AI800271	Hs.129445	hypothetical protein FLJ12496	4.42
438209	AL120659	Hs.6111	aryl-hydrocarbon receptor nuclear transl	4.42
431724	AA514535	Hs.283704	ESTs	4.41
412280	AW205116	Hs.272814	hypothetical protein DKFZp434E1723	4.40
440801	AA906366	Hs.190535	ESTs	4.40
452959	AI933416	Hs.189674	ESTs	4.40
453861	AI026838	Hs.30120	ESTs, Weakly similar to NUCL_HUMAN NUCLE	4.40
417421	AL138201	Hs.82120	nuclear receptor subfamily 4, group A, m	4.40
447270	AC002551	Hs.331	general transcription factor IIIC, polyp	4.38
433641	AF080229		gb:Human endogenous retrovirus K clone 1	4.38
447078	AW885727	Hs.301570	ESTs	4.38
424242	AA337476		hypothetical protein MGC13102	4.37
408170	AW204516	Hs.31835	ESTs	4.36
448757	AI366784	Hs.48820	TATA box binding protein (TBP)-associate	4.36
420021	AA252848	Hs.293557	ESTs	4.36
449694	AI659790	Hs.253302	ESTs	4.36
453867	AI929383	Hs.108196	hypothetical protein DKFZp434N185	4.36
458712	AI347502	Hs.173066	hypothetical protein FLJ20761	4.36
417251	AW015242	Hs.99488	ESTs, Weakly similar to YK54_YEAST HYPOT	4.35
434423	NM_006769	Hs.3844	LIM domain only 4	4.35
423427	AL137612	Hs.285848	KIAA1454 protein	4.34
415715	F30364		ESTs	4.33
404561				4.32
422969	AA782536	Hs.122647	N-myristoyltransferase 2	4.32
423685	BE350494	Hs.49753	uveal autoantigen with coiled coil domai	4.32
443977	AL120986	Hs.150627	ESTs, Weakly similar to I38022 hypotheti	4.32
425071	NM_013989	Hs.154424	deiodinase, iodothyronine, type II	4.32
431583	AL042613	Hs.262476	S-adenosylmethionine decarboxylase 1	4.31
411379	AI816344	Hs.12554	ESTs, Weakly similar to NPL4_HUMAN NUCLE	4.30
421476	AW953805	Hs.21887	ESTs	4.30
425178	H16097	Hs.161027	ESTs	4.30
439262	AA832333	Hs.124399	ESTs	4.30
442818	AK001741	Hs.8739	hypothetical protein FLJ10879	4.30
421977	W94197	Hs.110165	ribosomal protein L26 homolog	4.29
437114	AA836641	Hs.163085	ESTs	4.28
420195	N44348	Hs.300794	Homo sapiens cDNA FLJ11177 fis, clone PL	4.28
418330	BE409405	Hs.94722	ESTs	4.27
419750	AL079741	Hs.183114	Homo sapiens cDNA FLJ14236 fis, clone NT	4.26
437065	AL036450	Hs.103238	ESTs	4.26
455276	BE176479		gb:RC3-HT0585-160300-022-b09 HT0585 Homo	4.24

416292	AA179233	Hs.42390	nasopharyngeal carcinoma susceptibility	4.24
423740	Y07701	Hs.132243	aminopeptidase puromycin sensitive	4.24
442023	AI187878	Hs.144549	ESTs	4.24
426764	AA732524	Hs.151464	ESTs, Weakly similar to ALUC_HUMAN !!!!	4.23
454058	AI273419	Hs.135146	hypothetical protein FLJ13984	4.23
456511	AA282330	Hs.145668	ESTs	4.22
448330	AL036449	Hs.207163	ESTs	4.22
424701	NM_005923	Hs.151988	mitogen-activated protein kinase kinase	4.21
432621	AI298501	Hs.12807	ESTs, Weakly similar to T48428 hypotheti	4.20
445707	AI248720	Hs.114390	ESTs	4.20
419910	AA662913	Hs.190173	ESTs, Weakly similar to A46010 X-linked	4.20
424085	NM_002914	Hs.139226	replication factor C (activator 1) 2 (40	4.20
440749	W22335	Hs.7392	hypothetical protein MGC3199	4.20
442787	W93048	Hs.227203	hypothetical protein MGC2747	4.20
443414	R54594	Hs.25209	ESTs	4.20
443556	AA256769	Hs.94949	methylmalonyl-CoA epimerase	4.20
444170	AW613879	Hs.102408	ESTs	4.20
446751	AA766998	Hs.85874	Human DNA sequence from clone RP11-16L21	4.20
421041	N36914	Hs.14691	ESTs, Moderately similar to I38022 hypot	4.19
447476	BE293466	Hs.20880	ESTs, Weakly similar to I38022 hypotheti	4.19
448543	AW897741	Hs.21380	Homo sapiens mRNA; cDNA DKFZp586P1124 (f	4.18
410294	AB014515	Hs.288891	KIAA0615 gene product	4.18
433607	AA602004	Hs.23260	ESTs	4.18
435552	AI668636	Hs.193480	ESTs, Moderately similar to ALU6_HUMAN A	4.18
447124	AW976438	Hs.17428	RBP1-like protein	4.18
453308	AW959731	Hs.32538	ESTs	4.17
439328	W07411	Hs.118212	ESTs, Moderately similar to ALU3_HUMAN A	4.16
430473	AW130690	Hs.299842	ESTs	4.16
437257	AI283085	Hs.290931	ESTs, Weakly similar to YFJ7_YEAST HYPOT	4.16
438018	AK001160	Hs.5999	hypothetical protein FLJ10298	4.16
443857	AI089292	Hs.287621	hypothetical protein FLJ14069	4.15
446711	AF169692	Hs.12450	protocadherin 9	4.15
419103	Z40229	Hs.96423	hypothetical protein FLJ23033	4.14
405403				4.14
407378	AA299264		ESTs, Moderately similar to I38022 hypot	4.14
408986	AW298602	Hs.197687	ESTs	4.14
418727	AA227609	Hs.94834	ESTs	4.14
434400	AI478211	Hs.186896	Homo sapiens cDNA FLJ11417 fis, clone HE	4.14
438578	AA811244	Hs.164168	ESTs	4.14
450459	AI697193	Hs.299254	Homo sapiens cDNA: FLJ23597 fis, clone L	4.14
429887	AW366286	Hs.145696	splicing factor (CC1.3)	4.13
448148	NM_016578	Hs.20509	HBV pX associated protein-8	4.13
450316	W84446	Hs.17850	hypothetical protein MGC4643	4.12
417531	NM_003157	Hs.1087	serine/threonine kinase 2	4.12
431592	R69016	Hs.293871	hypothetical protein MGC10895s	4.12
432463	AA548518	Hs.186733	ESTs	4.12
433613	AA836126	Hs.5669	ESTs	4.12
434739	AA804487	Hs.144130	ESTs	4.12
438259	AW205969	Hs.131808	ESTs	4.12
425810	AI923627	Hs.31903	ESTs	4.10
432672	AW973775	Hs.130760	myosin phosphatase, target subunit 2	4.10
433345	AI681545	Hs.152982	hypothetical protein FLJ13117	4.10
432712	AB016247	Hs.288031	sterol-C5-desaturase (fungal ERG3, delta	4.09
453020	AL162039	Hs.31422	Homo sapiens mRNA; cDNA DKFZp434M229 (fr	4.09
412045	AA099802	Hs.4299	transmembrane, prostate androgen induced	4.09
435114	AA775483	Hs.288936	mitochondrial ribosomal protein L9	4.08
443204	AW205878	Hs.29643	Homo sapiens cDNA FLJ13103 fis, clone NT	4.08
445459	AI478629	Hs.158465	likely ortholog of mouse putative IKK re	4.08
438938	H46212	Hs.137221	ESTs	4.07
454119	BE549773	Hs.40510	uncoupling protein 4	4.06
411000	N40449	Hs.201619	ESTs, Weakly similar to S38383 SEB4B pro	4.06
418926	AA232658	Hs.87070	UDP-glucose:glycoprotein glucosyltransfe	4.06
424432	AB037821	Hs.146858	protocadherin 10	4.06
449673	AA002064	Hs.18920	ESTs	4.06
429299	AI620463	Hs.99197	hypothetical protein MGC13102	4.06
422174	AL049325	Hs.112493	Homo sapiens mRNA; cDNA DKFZp564D036 (fr	4.05
455497	AA112573	Hs.285691	Homo sapiens prostein mRNA, complete cds	4.05
415138	C18356	Hs.78045	tissue factor pathway inhibitor 2	4.04
402791				4.04

426792	AL044854	Hs.172329	KIAA0576 protein	4.04
438660	U95740	Hs.6349	Homo sapiens, clone IMAGE:3010666, mRNA,	4.04
442768	AL048534	Hs.48458	ESTs, Weakly similar to ALU8_HUMAN ALU S	4.04
447568	AF155655	Hs.18885	CGI-116 protein	4.04
428342	AI739168	Hs.131798	Homo sapiens cDNA FLJ13458 fis, clone PL	4.04
453439	AI572438	Hs.32976	guanine nucleotide binding protein 4	4.02
453857	AL080235	Hs.35861	DKFZP586E1621 protein	4.02
428249	AA130914	Hs.183291	zinc finger protein 268	4.02
432015	AL157504	Hs.159115	Homo sapiens mRNA; cDNA DKFZp586O0724 (f	4.02
445495	BE622641	Hs.38489	ESTs, Weakly similar to I38022 hypotheti	4.02
451746	M86178		ESTs	4.02
452211	AI985513	Hs.233420	ESTs	4.02
453046	AA284040	Hs.219441	ESTs, Highly similar to CA5B_HUMAN CARBO	4.02
456038	AA203285	Hs.294141	ESTs, Weakly similar to alternatively sp	4.02
452449	AW068658	Hs.20943	ESTs	4.02
407204	R41933	Hs.140237	ESTs, Weakly similar to ALU1_HUMAN ALU S	4.01
428046	AW812795	Hs.155381	ESTs, Moderately similar to I38022 hypot	4.01
438520	AA706319	Hs.98416	ESTs	4.01
443292	AK000213	Hs.9196	hypothetical protein	4.01
432715	AA247152	Hs.200483	ESTs, Weakly similar to KIAA1074 protein	4.00
403797				4.00
418347	AA216419	Hs.269295	gb:nc16e03.s1 NCI_CGAP_Pr1 Homo sapiens	4.00
419459	AW291128	Hs.278422	DKFZP586G1122 protein	4.00
420911	U77413	Hs.100293	O-linked N-acetylglucosamine (GlcNAc) tr	4.00
425176	AW015644	Hs.301430	TEA domain family member 1 (SV40 transcr	4.00
447505	AL049266	Hs.18724	Homo sapiens mRNA; cDNA DKFZp564F093 (fr	4.00
453773	AL133761		gb:DKFZp761C1413_r1 761 (synonym: hamy2)	4.00
434384	AA631910	Hs.162849	ESTs	3.99
422471	AA311027	Hs.271894	ESTs, Weakly similar to I38022 hypotheti	3.99
427386	AW836261	Hs.177486	ESTs	3.98
433394	AI907753	Hs.93810	cerebral cavernous malformations 1	3.98
441269	AW015206	Hs.178784	ESTs	3.97
419629	AB020695	Hs.91662	KIAA0888 protein	3.96
435008	AF150262	Hs.162898	ESTs	3.96
456649	R74441	Hs.117176	poly(A)-binding protein, nuclear 1	3.96
418723	AA504428	Hs.10487	Homo sapiens, clone IMAGE:3954132, mRNA,	3.96
428738	NM_000380	Hs.192803	xeroderma pigmentosum, complementation g	3.95
430456	AA314998	Hs.241503	hypothetical protein	3.95
422017	NM_003877	Hs.110776	STAT induced STAT inhibitor-2	3.95
409960	BE261944	Hs.153028	hexokinase 1	3.95
455309	AW894017		gb:RC4-NN0027-150400-012-g04 NN0027 Homo	3.95
450295	AI766732	Hs.201194	ESTs	3.94
456660	AA909249	Hs.112282	solute carrier family 30 (zinc transport	3.94
410908	AA121686	Hs.10592	ESTs	3.94
447145	AA761073	Hs.192943	TRAF family member-associated NFKB activ	3.94
449318	AW238021	Hs.108788	Homo sapiens, Similar to RIKEN cDNA 5730	3.94
449869	W57990	Hs.60059	Homo sapiens cDNA FLJ11478 fis, clone HE	3.94
411887	AW182924	Hs.128790	ESTs	3.93
437531	AI400752	Hs.112259	T cell receptor gamma locus	3.93
452238	F01811	Hs.187931	ESTs	3.93
410486	AW235094	Hs.193424	zinc finger protein	3.92
424882	AI379461	Hs.153636	far upstream element (FUSE) binding prot	3.92
426269	H15302	Hs.168950	Homo sapiens mRNA; cDNA DKFZp566A1046 (f	3.92
427043	AA397679	Hs.298460	ESTs	3.92
440404	AI015881	Hs.125616	mitochondrial ribosomal protein S5	3.92
452762	AW501435	Hs.171409	v-akt murine thymoma viral oncogene homo	3.92
453058	AW612293	Hs.288684	Homo sapiens cDNA FLJ11750 fis, clone HE	3.92
423583	AL122055	Hs.129836	KIAA1028 protein	3.92
408001	AA046458	Hs.95296	ESTs	3.92
419197	N48921	Hs.27441	KIAA1615 protein	3.91
428695	AI355647	Hs.189999	purinergic receptor (family A group 5)	3.91
401747				3.91
410011	AB020641	Hs.57856	PFTAIRE protein kinase 1	3.91
432205	AI806583	Hs.125291	ESTs	3.91
447857	AA081218	Hs.58608	Homo sapiens cDNA FLJ14206 fis, clone NT	3.91
448494	AA463276	Hs.288906	WW Domain-Containing Gene	3.91
409928	AL137163	Hs.57549	hypothetical protein dJ473B4	3.90
411598	BE336654	Hs.70937	H3 histone family, member A	3.90
424790	AL119344	Hs.13326	ESTs, Weakly similar to 2004399A chromos	3.90

425707	AF115402	Hs.11713	E74-like factor 5 (ets domain transcript	3.90
431325	AW026751	Hs.5794	ESTs, Weakly similar to 2109260A B cell	3.89
451806	NM_003729	Hs.27076	RNA 3'-terminal phosphate cyclase	3.89
401045				3.89
433023	AW864793	Hs.34161	thrombospondin 1	3.89
452160	BE378541	Hs.279815	cysteine sulfinic acid decarboxylase-rel	3.89
437372	AA323968	Hs.283631	hypothetical protein DKFZp547G183	3.89
417067	AJ001417	Hs.81086	solute carrier family 22 (extraneuronal	3.88
410467	AF102546	Hs.63931	dachshund (Drosophila) homolog	3.88
422660	AW297582	Hs.237062	hypothetical protein FLJ22548 similar to	3.88
431930	AB035301	Hs.272211	cadherin 7, type 2	3.88
453047	AW023798	Hs.286025	ESTs	3.88
433891	AA613792		gb:no97h03.s1 NCI_CGAP_Pr2 Homo sapiens	3.88
401785				3.88
431088	AA491824	Hs.196881	ESTs	3.88
451952	AL120173	Hs.301663	ESTs	3.87
422089	AA523172	Hs.103135	ESTs, Weakly similar to SFR4_HUMAN SPLIC	3.87
452277	AL049013	Hs.28783	KIAA1223 protein	3.87
438279	AA805166	Hs.165165	HIV-1 rev binding protein 2	3.86
458229	AI929602	Hs.177	phosphatidylinositol glycan, class H	3.86
406414				3.86
417193	AI922189	Hs.288390	hypothetical protein FLJ22795	3.85
413174	AA723564	Hs.191343	ESTs	3.85
433332	AI367347	Hs.127809	Homo sapiens clone TCCCTA00151 mRNA sequ	3.85
411089	AA456454	Hs.118637	cell division cycle 2-like 1 (PITSLRE pr	3.85
412494	AL133900	Hs.792	ADP-ribosylation factor domain protein 1	3.84
413530	AA130158	Hs.19977	ESTs, Moderately similar to ALU8_HUMAN A	3.84
459592	AL037421	Hs.208746	ESTs, Moderately similar to pot. ORF I [	3.84
418329	AW247430	Hs.84152	cystathionine-beta-synthase	3.83
451468	AW503398	Hs.210047	ESTs, Moderately similar to I38022 hypot	3.83
434804	AA649530		gb:ns44f05.s1 NCI_CGAP_Alv1 Homo sapiens	3.83
401819				3.82
424179	F30712		Homo sapiens, clone IMAGE:4285740, mRNA	3.82
424850	AA151057	Hs.153498	chromosome 18 open reading frame 1	3.82
426472	BE246138	Hs.30853	ESTs	3.82
426625	T78300	Hs.171409	serologically defined colon cancer antig	3.82
427585	D31152	Hs.179729	collagen, type X, alpha 1 (Schmid metaph	3.82
427756	AI376540	Hs.15574	ESTs	3.82
444701	AI916512	Hs.198394	ESTs	3.82
423052	M28214	Hs.123072	RAB3B, member RAS oncogene family	3.82
429259	AA420450	Hs.292911	ESTs, Highly similar to S60712 band-6-pr	3.82
416111	AA033813	Hs.79018	chromatin assembly factor 1, subunit A (	3.82
433586	T85301		gb:yd78d06.s1 Soares fetal liver spleen	3.81
438527	AI969251	Hs.143237	RAB7, member RAS oncogene family-like 1	3.81
410297	AA148710	Hs.159441	lumican	3.81
429898	AW117322	Hs.42366	ESTs	3.81
409079	W87707	Hs.82065	interleukin 6 signal transducer (gp130,	3.80
419423	D26488	Hs.90315	KIAA0007 protein	3.80
429643	AA455889	Hs.187548	FYVE-finger-containing Rab5 effector pro	3.80
431499	NM_001514	Hs.258561	general transcription factor IIB	3.80
445060	AA830811	Hs.88808	ESTs	3.80
449419	R34910	Hs.119172	ESTs	3.80
450584	AA040403	Hs.60371	ESTs	3.80
426137	AL040683	Hs.167031	DKFZP566D133 protein	3.79
420185	AL044056	Hs.158047	ESTs	3.79
410076	T05387	Hs.7991	ESTs	3.78
444078	BE246919	Hs.10290	U5 snRNP-specific 40 kDa protein (hPrp8-	3.78
417318	AW953937	Hs.12891	ESTs	3.78
414684	AA587775	Hs.66295	multi-PDZ-domain-containing protein	3.78
410275	U85658	Hs.61796	transcription factor AP-2 gamma (activat	3.77
410503	AW975746	Hs.188662	KIAA1702 protein	3.77
434170	AA626509	Hs.122329	ESTs	3.77
421838	AW881089	Hs.108806	Homo sapiens mRNA; cDNA DKFZp566M0947 (f	3.77
425268	AI807883	Hs.156932	Homo sapiens cDNA FLJ20653 fis, clone KA	3.76
431696	AA259068	Hs.267819	protein phosphatase 1, regulatory (inhib	3.76
411990	AW963624	Hs.31707	ESTs, Weakly similar to YEW4_YEAST HYPOT	3.76
430291	AV660345	Hs.238126	CGI-49 protein	3.76
448779	BE042877	Hs.177135	ESTs	3.76
452682	AA456193	Hs.155606	progesterone membrane binding protein	3.75

452598	AI831594	Hs.68647	ESTs, Weakly similar to ALU7_HUMAN ALU S	3.75
439498	AA908731	Hs.58297	CLLL8 protein	3.75
440258	AI741633	Hs.125350	ESTs	3.74
456848	AL121087	Hs.298406	KIAA0685 gene product	3.74
415082	AA160000	Hs.137396	ESTs, Weakly similar to JC5238 galactosy	3.74
420653	AI224532	Hs.88550	ESTs	3.74
431637	AI879330	Hs.265960	hypothetical protein FLJ10563	3.74
440411	N30256	Hs.156971	hypothetical protein DKFZp434G1415	3.74
405917				3.74
419440	AB020689	Hs.90419	KIAA0882 protein	3.74
451230	BE546208	Hs.26090	hypothetical protein FLJ20272	3.73
429597	NM_003816	Hs.2442	a disintegrin and metalloproteinase doma	3.73
430144	AI732722	Hs.187694	ERGL protein; ERGIC-53-like protein	3.72
438394	BE379623	Hs.27693	peptidylprolyl isomerase (cyclophilin)-l	3.72
440527	AV657117	Hs.184164	ESTs, Moderately similar to S65657 alpha	3.72
449433	AI672096	Hs.9012	ESTs, Weakly similar to S26650 DNA-bindi	3.72
456228	BE503227	Hs.134759	ESTs	3.72
448663	BE614599	Hs.106823	hypothetical protein MGC14797	3.72
415075	L27479	Hs.77889	Friedreich ataxia region gene X123	3.72
433544	AI793211	Hs.165372	ESTs, Moderately similar to ALU1_HUMAN A	3.71
418293	AI224483	Hs.16063	hypothetical protein FLJ21877	3.71
449897	AW819642	Hs.24135	transmembrane protein vezatin; hypotheti	3.71
420297	AI628272	Hs.88323	ESTs, Weakly similar to ALU1_HUMAN ALU S	3.70
423065	R96158	Hs.194606	Homo sapiens, clone MGC:5406, mRNA, comp	3.70
429340	N35938	Hs.199429	Homo sapiens mRNA; cDNA DKFZp434M2216 (f	3.70
437777	AA768098	Hs.189079	ESTs	3.70
440351	AF030933	Hs.7179	RAD1 (S. pombe) homolog	3.70
443603	BE502601	Hs.134289	ESTs, Weakly similar to KIAA1063 protein	3.70
446965	BE242873	Hs.16677	WD repeat domain 15	3.70
412350	AI659306	Hs.73826	protein tyrosine phosphatase, non-recept	3.70
433852	AI378329	Hs.126629	ESTs	3.70
433142	AL120697	Hs.110640	ESTs	3.69
419994	AA282881	Hs.190057	ESTs	3.69
412628	AI972402	Hs.173902	hypothetical protein MGC2648	3.69
431416	AA532718	Hs.178604	ESTs	3.69
439444	AI277652	Hs.54578	ESTs, Weakly similar to I38022 hypotheti	3.68
414709	AA704703	Hs.77031	Sp2 transcription factor	3.68
447397	BE247676	Hs.18442	E-1 enzyme	3.68
405718				3.68
425217	AU076696	Hs.155174	CDC5 (cell division cycle 5, S. pombe, h	3.68
442242	AV647908	Hs.90424	Homo sapiens cDNA: FLJ23285 fis, clone H	3.68
424690	BE538356	Hs.151777	eukaryotic translation initiation factor	3.68
421734	AI318624	Hs.107444	Homo sapiens cDNA FLJ20562 fis, clone KA	3.67
427221	L15409	Hs.174007	von Hippel-Lindau syndrome	3.67
439864	AI720078	Hs.291997	ESTs, Weakly similar to A47582 B-cell gr	3.66
402408				3.66
426327	W03242	Hs.44898	Homo sapiens clone TCCCTA00151 mRNA sequ	3.66
427119	AW880562	Hs.114574	ESTs	3.66
427356	AW023482	Hs.97849	ESTs	3.66
452946	X95425	Hs.31092	EphA5	3.66
419078	M93119	Hs.89584	insulinoma-associated 1	3.66
416295	AI064824	Hs.193385	ESTs	3.65
427144	X95097	Hs.2126	vasoactive intestinal peptide receptor 2	3.65
447500	AI381900	Hs.159212	ESTs	3.65
453127	AI696671	Hs.294110	ESTs	3.65
423396	AI382555	Hs.127950	bromodomain-containing 1	3.65
419346	AI830417		polybromo 1	3.64
441540	C01387	Hs.127128	ESTs	3.64
446501	AI302616	Hs.150819	ESTs	3.64
459527	AW977556	Hs.291735	ESTs, Weakly similar to I78885 serine/th	3.63
446320	AF126245	Hs.14791	acyl-Coenzyme A dehydrogenase family, me	3.63
435706	W31254	Hs.7045	GL004 protein	3.63
400110				3.62
410313	R10305	Hs.185683	ESTs	3.62
414713	BE465243	Hs.12664	ESTs	3.62
436279	AW900372	Hs.180793	ESTs, Weakly similar to S65657 alpha-1C-	3.62
439818	AL360137	Hs.19934	Homo sapiens mRNA full length insert cDN	3.62
451797	AW663858	Hs.56120	small inducible cytokine subfamily E, me	3.62
451294	AI457338	Hs.29894	ESTs	3.62

434194	AF119847	Hs.283940	Homo sapiens PRO1550 mRNA, partial cds	3.62
404939				3.62
408101	AW968504	Hs.123073	CDC2-related protein kinase 7	3.62
435846	AA700870	Hs.14304	ESTs	3.61
432833	N51075	Hs.47191	ESTs	3.61
427276	AA400269	Hs.49598	ESTs	3.61
433495	AW373784	Hs.71	alpha-2-glycoprotein 1, zinc	3.60
403137				3.60
404165				3.60
409571	AA504249	Hs.187585	ESTs	3.60
410561	BE540255	Hs.6994	Homo sapiens cDNA: FLJ22044 fis, clone H	3.60
412924	BE018422	Hs.75258	H2A histone family, member Y	3.60
434228	Z42047	Hs.283978	Homo sapiens PRO2751 mRNA, complete cds	3.60
436797	AA731491	Hs.178518	hypothetical protein MGC14879	3.60
437162	AW005505	Hs.5464	thyroid hormone receptor coactivating pr	3.60
437444	H46008	Hs.31518	ESTs	3.60
404210				3.59
446157	BE270828	Hs.131740	Homo sapiens cDNA: FLJ22562 fis, clone H	3.59
437587	AI591222	Hs.122421	Human DNA sequence from clone RP1-187J11	3.58
423147	AA987927	Hs.131740	Homo sapiens cDNA: FLJ22562 fis, clone H	3.57
452226	AA024898	Hs.296002	ESTs	3.56
443775	AF291664	Hs.204732	matrix metalloproteinase 26	3.56
452501	AB037791	Hs.29716	hypothetical protein FLJ10980	3.56
428647	AA830050	Hs.124344	ESTs	3.56
422443	NM_014707	Hs.116753	histone deacetylase 7B	3.55
447966	AA340605	Hs.105887	ESTs, Weakly similar to Homolog of rat Z	3.55
420892	AW975076	Hs.172589	nuclear phosphoprotein similar to S. cer	3.55
420230	AL034344	Hs.298020	forkhead box C1	3.55
418428	Y12490	Hs.85092	thyroid hormone receptor interactor 11	3.54
428949	AA442153	Hs.104744	hypothetical protein DKFZp434J0617	3.54
444929	AI685841	Hs.161354	ESTs	3.54
433339	AF019226	Hs.8036	glioblastoma overexpressed	3.54
424369	R87622	Hs.26714	KIAA1831 protein	3.54
433002	AF048730	Hs.279906	cyclin T1	3.53
435425	H16263	Hs.31416	ESTs	3.53
415621	AI648602	Hs.131189	ESTs	3.53
416974	AF010233	Hs.80667	RALBP1 associated Eps domain containing	3.53
405793				3.52
409770	AW499536		gb:UI-HF-BR0p-ajl-c-12-0-UI.r1 NIH_MGC_5	3.52
425305	AA363025	Hs.155572	Human clone 23801 mRNA sequence	3.52
428939	AW236550	Hs.131914	ESTs	3.52
438388	AA806349	Hs.44698	ESTs	3.52
443703	AV646177	Hs.213021	ESTs	3.52
457940	AL360159	Hs.30445	Homo sapiens TRIpartite motif protein ps	3.52
402444				3.52
409643	AW450866	Hs.257359	ESTs	3.51
418250	U29926	Hs.83918	adenosine monophosphate deaminase (isofo	3.51
432745	AI821926	Hs.269507	gb:nt78f05.x5 NCI_CGAP_Pr3 Homo sapiens	3.51
414222	AL135173	Hs.878	sorbitol dehydrogenase	3.51
430061	AB037817	Hs.230188	KIAA1396 protein	3.51
421491	H99999	Hs.42736	ESTs	3.50
422384	AA224077	Hs.42438	Sm protein F	3.50
434565	T52172		ESTs	3.50
438379	N23018	Hs.171391	C-terminal binding protein 2	3.50
439741	BE379646	Hs.6904	Homo sapiens mRNA full length insert cDN	3.50
447311	R37010	Hs.33417	Homo sapiens cDNA: FLJ22806 fis, clone K	3.50
447805	AW627932	Hs.19614	gemin4	3.50
454265	H03556	Hs.300949	ESTs, Weakly similar to thyroid hormone	3.50
418838	AW385224	Hs.35198	ectonucleotide pyrophosphatase/phosphodi	3.50
448804	AW512213	Hs.42500	ADP-ribosylation factor-like 5	3.50
409617	BE003760	Hs.55209	Homo sapiens mRNA; cDNA DKFZp434K0514 (f	3.49
434075	AW003416	Hs.160604	ESTs	3.49
444190	AI878918	Hs.10526	cysteine and glycine-rich protein 2	3.49
435017	AA336522	Hs.12854	angiotensin II, type I receptor-associat	3.48
423445	NM_014324	Hs.128749	alpha-methylacyl-CoA racemase	3.48
420271	AI954365	Hs.42892	ESTs	3.48
443684	AI681307	Hs.166674	ESTs	3.48
444168	AW379879		gb:RC1-HT0256-081199-011-f01 HT0256 Homo	3.48
446074	AA079799	Hs.29263	hypothetical protein FLJ11896	3.48

452582	AL137407	Hs.29911	Homo sapiens mRNA; cDNA DKFZp434M232 (fr	3.48
431542	H63010	Hs.5740	ESTs	3.48
432697	AW975050	Hs.293892	ESTs, Weakly similar to ALU4_HUMAN ALU S	3.48
435572	AW975339	Hs.239828	ESTs, Weakly similar to GAG2_HUMAN RETRO	3.47
407192	AA609200		gb:af12e02.s1 Soares_testis_NHT Homo sap	3.47
413435	X51405	Hs.75360	carboxypeptidase E	3.46
447210	AF035269	Hs.17752	phosphatidylserine-specific phospholipas	3.46
447958	AW798524	Hs.68644	Homo sapiens microsomal signal peptidase	3.46
425312	AA354940	Hs.145958	ESTs	3.46
442007	AA301116	Hs.142838	nucleolar phosphoprotein Nopp34	3.46
417455	AW007066	Hs.18949	ESTs, Weakly similar to CA2B_HUMAN COLLA	3.45
426931	NM_003416	Hs.2076	zinc finger protein 7 (KOX 4, clone HF.1	3.45
408739	W01556	Hs.238797	ESTs, Moderately similar to I38022 hypot	3.45
436024	AI800041	Hs.190555	ESTs	3.45
408418	AW963897	Hs.44743	KIAA1435 protein	3.45
409151	AA306105	Hs.50785	SEC22, vesicle trafficking protein (S. c	3.44
418626	AW299508	Hs.135230	ESTs	3.44
420560	AW207748	Hs.59115	ESTs	3.44
420686	AI950339	Hs.40782	ESTs	3.44
428870	AA436831	Hs.36049	ESTs	3.44
436754	AI061288	Hs.133437	ESTs	3.44
437960	AI669586	Hs.222194	ESTs	3.44
452300	AW628045	Hs.28896	Homo sapiens mRNA full length insert cDN	3.44
421887	AW161450	Hs.109201	CGI-86 protein	3.44

TABLE 5A shows the accession numbers for those primekeys lacking a unigeneID in Tables 5, 6, and 7. For each probeset we have listed the gene cluster number from which the oligonucleotides were designed. Gene clusters were compiled using sequences derived from Genbank ESTs and mRNAs. These sequences were clustered based on sequence similarity using Clustering and Alignment Tools (DoubleTwist, Oakland California). The Genbank accession numbers for sequences comprising each cluster are listed in the "Accession" column.

Pkey: Unique Eos probeset identifier number
CAT number: Gene cluster number
Accession: Genbank accession numbers

Pkey	CAT number	Accession
407596	1003489_1	R86913 R86901 H25352 R01370 H43764 AW044451 W21298
408432	1058667_1	AW195262 R27868 AW811262
409752	115301_1	AW963990 AA078196 AW749482 AA077468 BE151571 AA376917
409770	1154048_1	AW499536 AW499553 AW502138 AW499537 AW502136 AW501743
411440	124577_1	AW749402 AW749403 Z45743 R80376 AA093358
411479	1247077_1	AW848047 AW848202 AW848631 AW848142 AW848702 AW848121 AW848632 AW848140 AW848571 AW848009 AW848067 AW848069 AW848905 AW848214
411624	1252166_1	BE145964 BE146286 AW854564
412991	134248_1	AW949013 AA126111
414269	143133_1	AA298489 AA137165
415123	1523390_1	D60925 D60828 D80787
415715	1548818_1	F30364 F36559 T15435
416288	1585983_1	H51299 H44619 H46391 R86024 H51892 T72744
416289	1586037_1	W26333 R05358 H44682
417730	1695795_1	Z44761 R25801 R11926 R35604
418636	177402_1	AW749855 AA225995 AW750208 AW750206
419346	184129_1	AI830417 AA236612
419538	185688_1	AA603305 AA244095 AA244183
420111	190755_1	AA255652 AA280911 AW967920 AA262684
422219	213547_1	AW978073 AW978072 AA807550 AA306567
424179	236389_1	F30712 F35665 AW263888 AI904014 AI904018 AA336927 AA336502
424242	237181_1	AA337476 AW966227 AA450376 AW960222 AA381051
428002	285602_1	AA418703 AA418711 BE071915 BE071920 BE071912
429163	300543_1	AA884766 AW974271 AA592975 AA447312
432189	342819_1	AA527941 AI810608 AI620190 AA635266
432340	345248_1	AA534222 AA632632 T81234
432363	345469_1	AA534489 AW970240 AW970323
432966	356839_1	AA650114 AW974148 AA572946
433586	370470_1	T85301 AW517087 AA601054 BE073959
433641	37186_1	AF080229 AF080231 AF080230 AF080232 AF080233 AF080234 BE550633 AI636743 AW614951 BE467547 AI680833 AI633818 N29986 U87592 U87593 U87590 U87591 S46404 U87587 AA463992 AW206802 AI970376 AI583718 AI672574 N25695 AW665466 AI818326 AA126128 AI480345 AW013827 AA248638 AI214968 AA204735 AA207155 AA206262 AA204833 AW003247 AW496808 AI080480 AI631703 AI651023 AI867418 AW818140 AA502500 AI206199 AI671282 AI352545 BE501030 AI652535 BE465762 AA206331 AW451866 AA471088 AA206342 AA204834 AA206100 AW021661 AA332922 N66048 AA703396 H92278 AW139734 H92683 U87589 U87595 H69001 U87594 BE466420 AI624817 BE466611 AI206344 AA574397 AA348354 AI493192
433687	373061_1	AA743991 AA604852 AW272737
433891	376239_1	AA613792 AW182329 T05304 AW858385
434415	385931_1	BE177494 AW276909 AA632849
434565	38898_1	T52172 AF147324 T52248
434804	393481_1	AA649530 AA659316 H64973
437113	433234_1	AA744693 AW750059
444168	593829_1	AW379879 AI126285 H12014
448212	755099_1	AI475858 AW969013
448310	757918_1	AI480316 AW847535
451746	883303_1	M86178 AI813822 D56993

452560	922216_1	BE077084 AW139963 AW863127 AW806209 AW806204 AW806205 AW806206 AW806211 AW806212 AW806207 AW806208 AW806210 AI907497
452712	928309_1	AW838616 AW838660 BE144343 AI914520 AW888910 BE184854 BE184784
453773	980699_1	AL133761 AL133767
455276	1272541_1	BE176479 BE176678 BE176357 BE176550 AW886079 BE176676 BE176615 BE176555 BE176489 BE176610 BE176362
455309	1278153_1	AW894017 AW893956 AW894032

TABLE 5B shows the genomic positioning for those primekeys lacking unigene ID's and accession numbers in Tables 5, 6, and 7. For each predicted exon, we have listed the genomic sequence source used for prediction. Nucleotide locations of each predicted exon are also listed.

Pkey:	Unique number corresponding to an Eos probeset
Ref:	Sequence source. The 7 digit numbers in this column are Genbank Identifier (GI) numbers. "Dunham I. et al." refers to the publication entitled "The DNA sequence of human chromosome 22." Dunham I. et al., Nature (1999) 402:489-495.
Strand:	Indicates DNA strand from which exons were predicted.
Nt_position:	Indicates nucleotide positions of predicted exons.

Pkey	Ref	Strand	Nt_position
401045	8117619	Plus	90044-90184,91111-91345
401424	8176894	Plus	24223-24428
401451	6634068	Minus	119926-121272
401714	6715702	Plus	96484-96681
401747	9789672	Minus	118596-118816,119119-119244,119609-119761,120422-120990,130161-130381,130468-130593,131097-131258,131866-131932,132451-132575,133580-134011
401785	7249190	Minus	165776-165996,166189-166314,166408-166569,167112-167268,167387-167469,168634-168942
401819	7467933	Minus	28217-28486
402408	9796239	Minus	110326-110491
402444	9796614	Plus	28391-28517
402791	6137008	Minus	51036-51207
403047	3540153	Minus	59793-59968
403137	9211494	Minus	92349-92572,92958-93084,93579-93712,93949-94072,94591-94748,95214-95337
403721	7528046	Minus	156647-157366
403764	7717105	Minus	118692-118853
403797	8099896	Minus	123065-125008
404165	9926489	Minus	69025-69128
404210	5006246	Plus	169926-170121
404253	9367202	Minus	55675-56055
404561	9795980	Minus	69039-70100
404571	7249169	Minus	112450-112648
404721	9856648	Minus	173763-174294
404915	7341766	Minus	100915-101087
404939	6862697	Plus	175318-175476
405403	6850244	Minus	37491-37670,40951-41031
405685	4508129	Minus	37956-38097
405718	9795467	Plus	113080-113266
405793	1405887	Minus	89197-89453
405876	6758747	Plus	39694-40031
405917	7712162	Minus	106829-107213
406414	9256407	Plus	49593-49850
406554	7711566	Plus	106956-107121

TABLE 6:286 GENES ENCODING EXTRACELLULAR OR CELL SURFACE PROTEINS UP-REGULATED IN PROSTATE CANCER COMPARED TO NORMAL ADULT TISSUES

Table 6 shows 286 genes up-regulated in prostate cancer compared to normal adult tissues that are likely to be extracellular or cell-surface proteins. These were selected as for Table 5 and the predicted protein contained a structural domain that is indicative of extracellular localization (e.g. egf, 7tm domains).

Pkey: Unique Eos probeset identifier number
ExAccn: Exemplar Accession number, Genbank accession number
UnigeneID: Unigene number
Unigene Title: Unigene gene title
R1: Ratio of tumor to normal tissue

Pkey	ExAccn	UnigeneID	Uningene Title	R1
409361	NM_005982	Hs.54416	sine oculis homeobox (Drosophila) homolo	48.28
409731	AA125985	Hs.56145	thymosin, beta, identified in neuroblast	45.24
400298	AA032279	Hs.61635	six transmembrane epithelial antigen of	43.48
420154	AI093155	Hs.95420	JM27 protein	41.12
426747	AA535210	Hs.171995	kallikrein 3, (prostate specific antigen	31.80
400299	X07730	Hs.171995	kallikrein 3, (prostate specific antigen	24.91
425075	AA506324	Hs.1852	acid phosphatase, prostate	24.23
424846	AU077324	Hs.1832	neuropeptide Y	23.57
405685				20.90
420757	X78592	Hs.99915	androgen receptor (dihydrotestosterone r	19.72
418994	AA296520	Hs.89546	selectin E (endothelial adhesion molecul	19.56
452792	AB037765	Hs.30652	KIAA1344 protein	17.39
445472	AB006631	Hs.12784	Homo sapiens mRNA for KIAA0293 gene, par	17.00
414565	AA502972	Hs.183390	hypothetical protein FLJ13590	16.82
431716	D89053	Hs.268012	fatty-acid-Coenzyme A ligase, long-chain	16.60
408430	S79876	Hs.44926	dipeptidylpeptidase IV (CD26, adenosine	16.28
408000	L11690	Hs.620	bullous pemphigoid antigen 1 (230/240kD)	15.54
430226	BE245562	Hs.2551	adrenergic, beta-2-, receptor, surface	15.40
444484	AK002126	Hs.11260	hypothetical protein FLJ11264	14.76
418601	AA279490	Hs.86368	calmegin	14.56
448999	AF179274	Hs.22791	transmembrane protein with EGF-like and	14.55
416182	NM_004354	Hs.79069	cyclin G2	12.94
420544	AA677577	Hs.98732	Homo sapiens Chromosome 16 BAC clone CIT	12.79
445413	AA151342	Hs.12677	CGI-147 protein	12.64
453930	AA419466	Hs.36727	hypothetical protein FLJ10903	12.22
440286	U29589	Hs.7138	cholinergic receptor, muscarinic 3	12.04
452784	BE463857	Hs.151258	hypothetical protein FLJ21062	11.86
450203	AF097994	Hs.301528	L-kynurenine/alpha-aminoadipate aminotra	11.68
448045	AJ297436	Hs.20166	prostate stem cell antigen	11.51
449650	AF055575	Hs.23838	calcium channel, voltage-dependent, L ty	11.18
420381	D50640	Hs.337616	phosphodiesterase 3B, cGMP-inhibited	11.10
425665	AK001050	Hs.159066	hypothetical protein FLJ10188	11.08
425710	AF030880	Hs.159275	solute carrier family, member 4	11.08
428728	NM_016625	Hs.191381	hypothetical protein	11.04
407021	U52077		gb:Human mariner1 transposase gene, comp	11.02
410733	D84284	Hs.66052	CD38 antigen (p45)	11.02
452340	NM_002202	Hs.505	ISL1 transcription factor, LIM/homeodoma	10.85
428819	AL135623	Hs.193914	KIAA0575 gene product	10.48
421991	NM_014918	Hs.110488	KIAA0990 protein	10.04
431217	NM_013427	Hs.250830	Rho GTPase activating protein 6	9.75
421470	R27496	Hs.1378	annexin A3	9.64
409262	AK000631	Hs.52256	hypothetical protein FLJ20624	9.45
435980	AF274571	Hs.129142	deoxyribonuclease II beta	9.24
421246	AW582962	Hs.102897	CGI-47 protein	9.20
410001	AB041036	Hs.57771	kallikrein 11	9.03
441791	AW372449	Hs.175982	hypothetical protein FLJ21159	9.02

404571				8.66
456497	AW967956	Hs.123648	ESTs, Weakly similar to AF108460 1 ubinu	8.56
419968	X04430	Hs.93913	interleukin 6 (interferon, beta 2)	8.36
433172	AB037841	Hs.102652	hypothetical protein ASH1	8.30
422631	BE218919	Hs.118793	hypothetical protein FLJ10688	8.27
427674	NM_003528	Hs.2178	H2B histone family, member Q	8.20
404915				8.08
452259	AA317439	Hs.28707	signal sequence receptor, gamma (translo	8.06
452891	N75582	Hs.212875	ESTs, Weakly similar to DYH9_HUMAN CILIA	8.02
439731	AI953135	Hs.45140	hypothetical protein FLJ14084	7.98
419839	U24577	Hs.93304	phospholipase A2, group VII (platelet-ac	7.68
420120	AL049610	Hs.95243	transcription elongation factor A (SII)-	7.64
424099	AF071202	Hs.139336	ATP-binding cassette, sub-family C (CFTR	7.64
448706	AW291095	Hs.21814	interleukin 20 receptor, alpha	7.52
410227	AB009284	Hs.61152	exostoses (multiple)-like 2	7.49
425211	M18667	Hs.1867	progastricsin (pepsinogen C)	7.35
441736	AW292779	Hs.169799	ESTs	7.28
419991	AJ000098	Hs.94210	eyes absent (Drosophila) homolog 1	7.20
425018	BE245277	Hs.154196	E4F transcription factor 1	7.20
424560	AA158727	Hs.150555	protein predicted by clone 23733	7.18
409110	AA191493	Hs.48778	niban protein	7.10
421566	NM_000399	Hs.1395	early growth response 2 (Krox-20 (Drosop	7.04
431725	X65724	Hs.2839	Norrie disease (pseudoglioma)	6.98
425782	U66468	Hs.159525	cell growth regulatory with EF-hand doma	6.85
427408	AA583206	Hs.2156	RAR-related orphan receptor A	6.79
435604	AA625279	Hs.26892	uncharacterized bone marrow protein BM04	6.73
415874	AF091622	Hs.78893	KIAA0244 protein	6.54
401451				6.52
431778	AL080276	Hs.268562	regulator of G-protein signalling 17	6.51
409089	NM_014781	Hs.50421	KIAA0203 gene product	6.50
431992	NM_002742	Hs.2891	protein kinase C, mu	6.49
404253				6.42
421552	AF026692	Hs.105700	secreted frizzled-related protein 4	6.41
416806	NM_000288	Hs.79993	peroxisomal biogenesis factor 7	6.38
431958	X63629	Hs.2877	cadherin 3, type 1, P-cadherin (placenta	6.30
439366	AF100143	Hs.6540	fibroblast growth factor 13	6.30
416836	D54745	Hs.80247	cholecystokinin	6.30
433383	AF034837	Hs.192731	double-stranded RNA specific adenosine d	6.29
450728	AW162923	Hs.25363	presenilin 2 (Alzheimer disease 4)	6.25
413384	NM_000401	Hs.75334	exostoses (multiple) 2	6.22
423349	AF010258	Hs.127428	homeo box A9	6.20
424800	AL035588	Hs.153203	MyoD family inhibitor	6.18
425451	AF242769	Hs.157461	mesenchymal stem cell protein DSC54	6.14
447359	NM_012093	Hs.18268	adenylate kinase 5	6.00
410889	X91662	Hs.66744	twist (Drosophila) homolog (acrocephalos	5.97
408829	NM_006042	Hs.48384	heparan sulfate (glucosamine) 3-O-sulfot	5.94
453911	AW503857	Hs.4007	Sarcolemmal-associated protein	5.94
408875	NM_015434	Hs.48604	DKFZP434B168 protein	5.92
450480	X82125	Hs.25040	zinc finger protein 239	5.90
451684	AF216751	Hs.26813	CDA14	5.88
400301	X03635	Hs.1657	estrogen receptor 1	5.78
415077	L41607	Hs.934	glucosaminyl (N-acetyl) transferase 2, I	5.74
418852	BE537037	Hs.273294	hypothetical protein FLJ20069	5.72
446867	AB007891	Hs.16349	KIAA0431 protein	5.72
410232	AW372451	Hs.61184	CGI-79 protein	5.70
422762	AL031320	Hs.119976	Human DNA sequence from clone RP1-20N2 o	5.70
450616	AL133067	Hs.302689	hypothetical protein	5.70
408621	AI970672	Hs.46638	chromosome 11 open reading frame 8	5.65
439671	AW162840	Hs.6641	kinesin family member 5C	5.64
410196	AI936442	Hs.59838	hypothetical protein FLJ10808	5.60
429170	NM_001394	Hs.2359	dual specificity phosphatase 4	5.60
440738	AI004650	Hs.225674	WD repeat domain 9	5.60
414342	AA742181	Hs.75912	KIAA0257 protein	5.59
422634	NM_016010	Hs.118821	CGI-62 protein	5.56
400268				5.55
439569	AW602166	Hs.222399	CEGP1 protein	5.51
452823	AB012124	Hs.30696	transcription factor-like 5 (basic helix	5.48
431938	AA938471	Hs.54431	specific granule protein (28 kDa); cyste	5.44
427638	AA406411	Hs.208341	ESTs, Weakly similar to KIAA0989 protein	5.42

421264	AL039123	Hs.103042	microtubule-associated protein 1B	5.38
421685	AF189723	Hs.106778	ATPase, Ca++ transporting, type 2C, memb	5.37
421987	AI133161	Hs.286131	CGI-101 protein	5.36
422806	BE314767	Hs.1581	glutathione S-transferase theta 2	5.34
432281	AK001239	Hs.274263	hypothetical protein FLJ10377	5.32
451982	F13036	Hs.27373	Homo sapiens mRNA; cDNA DKFZp564O1763 (f	5.32
444042	NM_004915	Hs.10237	ATP-binding cassette, sub-family G (WHIT	5.31
447752	M73700	Hs.105938	lactotransferrin	5.29
451418	BE387790	Hs.26369	hypothetical protein FLJ20287	5.22
428593	AW207440	Hs.185973	degenerative spermatocyte (homolog Droso	5.21
447541	AK000288	Hs.18800	hypothetical protein FLJ20281	5.18
459294	AW977286	Hs.17428	RBP1-like protein	5.16
424692	AA429834	Hs.151791	KIAA0092 gene product	5.15
416434	AW163045	Hs.79334	nuclear factor, interleukin 3 regulated	5.11
410268	AA316181	Hs.61635	six transmembrane epithelial antigen of	5.10
417517	AF001176	Hs.82238	POP4 (processing of precursor , S. cerev	5.10
453616	NM_003462	Hs.33846	dynein, axonemal, light intermediate pol	5.10
427958	AA418000	Hs.98280	potassium intermediate/small conductance	5.09
407945	X69208	Hs.606	ATPase, Cu++ transporting, alpha polypep	5.08
418576	AW968159	Hs.289104	Alu-binding protein with zinc finger dom	5.05
413328	Y15723	Hs.75295	guanylate cyclase 1, soluble, alpha 3	5.04
432729	AK000292	Hs.278732	hypothetical protein FLJ20285	5.04
426342	AF093419	Hs.169378	multiple PDZ domain protein	5.02
429782	NM_005754	Hs.220689	Ras-GTPase-activating protein SH3-domain	5.02
436209	AW850417	Hs.254020	ESTs, Moderately similar to unnamed prot	5.02
430599	NM_004855	Hs.247118	phosphatidylinositol glycan, class B	5.00
451386	AB029006	Hs.26334	spastic paraplegia 4 (autosomal dominant	5.00
457211	AW972565	Hs.32399	ESTs, Weakly similar to S51797 vasodilat	4.97
425851	NM_001490	Hs.159642	glucosaminyl (N-acetyl) transferase 1, c	4.97
421689	N87820	Hs.106826	KIAA1696 protein	4.93
416533	BE244053	Hs.79362	retinoblastoma-like 2 (p130)	4.92
432653	N62096	Hs.293185	ESTs, Weakly similar to JC7328 amino aci	4.91
403047				4.91
431117	AF003522	Hs.250500	delta (Drosophila)-like 1	4.90
427617	D42063	Hs.199179	RAN binding protein 2	4.88
428804	AK000713	Hs.193736	hypothetical protein FLJ20706	4.88
449071	NM_005872	Hs.22960	breast carcinoma amplified sequence 2	4.86
407596	R86913		gb:yq30f05.r1 Soares fetal liver spleen	4.84
456516	BE172704	Hs.222746	KIAA1610 protein	4.84
458339	AW976853	Hs.172843	ESTs	4.83
422083	NM_001141	Hs.111256	arachidonate 15-lipoxygenase, second typ	4.82
449535	W15267	Hs.23672	low density lipoprotein receptor-related	4.82
422048	NM_012445	Hs.288126	spondin 2, extracellular matrix protein	4.82
424602	AK002055	Hs.151046	hypothetical protein FLJ11193	4.78
410765	AI694972	Hs.66180	nucleosome assembly protein 1-like 2	4.77
419879	Z17805	Hs.93564	Homer, neuronal immediate early gene, 2	4.74
450649	NM_001429	Hs.25272	E1A binding protein p300	4.74
411624	BE145964	Hs.103283	KIAA0594 protein	4.72
404721				4.70
426261	AW242243	Hs.168670	peroxisomal farnesylated protein	4.70
416276	U41060	Hs.79136	LIV-1 protein, estrogen regulated	4.64
408374	AW025430	Hs.155591	forkhead box F1	4.64
451900	AB023199	Hs.27207	KIAA0982 protein	4.63
421437	AW821252	Hs.104336	hypothetical protein	4.63
434629	AA789081	Hs.4029	glioma-amplified sequence-41	4.60
403764				4.58
421247	BE391727	Hs.102910	general transcription factor IIH, polype	4.53
403721				4.50
453070	AK001465	Hs.31575	SEC63, endoplasmic reticulum translocon	4.49
417412	X16896	Hs.82112	interleukin 1 receptor, type I	4.48
439735	AI635386	Hs.142846	hypothetical protein	4.48
430261	AA305127	Hs.237225	hypothetical protein HT023	4.46
430598	AK001764	Hs.247112	hypothetical protein FLJ10902	4.44
400303	AA242758	Hs.79136	LIV-1 protein, estrogen regulated	4.42
438209	AL120659	Hs.6111	aryl-hydrocarbon receptor nuclear transl	4.42
417421	AL138201	Hs.82120	nuclear receptor subfamily 4, group A, m	4.40
447270	AC002551	Hs.331	general transcription factor IIIC, polyp	4.38
434423	NM_006769	Hs.3844	LIM domain only 4	4.35
404561				4.32

422969	AA782536	Hs.122647	N-myristoyltransferase 2	4.32
423685	BE350494	Hs.49753	uveal autoantigen with coiled coil domai	4.32
425071	NM_013989	Hs.154424	deiodinase, iodothyronine, type II	4.32
431583	AL042613	Hs.262476	S-adenosylmethionine decarboxylase 1	4.31
442818	AK001741	Hs.8739	hypothetical protein FLJ10879	4.30
423740	Y07701	Hs.293007	aminopeptidase puromycin sensitive	4.24
424701	NM_005923	Hs.151988	mitogen-activated protein kinase kinase	4.21
424085	NM_002914	Hs.139226	replication factor C (activator 1) 2 (40	4.20
410294	AB014515	Hs.323712	KIAA0615 gene product	4.18
447124	AW976438	Hs.17428	RBP1-like protein	4.18
438018	AK001160	Hs.5999	hypothetical protein FLJ10298	4.16
443857	AI089292	Hs.287621	hypothetical protein FLJ14069	4.15
446711	AF169692	Hs.12450	protocadherin 9	4.15
405403				4.14
448148	NM_016578	Hs.20509	HBV pX associated protein-8	4.13
417531	NM_003157	Hs.1087	serine/threonine kinase 2	4.12
433345	AI681545	Hs.152982	hypothetical protein FLJ13117	4.10
432712	AB016247	Hs.288031	sterol-C5-desaturase (fungal ERG3, delta	4.09
435114	AA775483	Hs.288936	mitochondrial ribosomal protein L9	4.08
445459	AI478629	Hs.158465	likely ortholog of mouse putative IKK re	4.08
402791				4.04
438660	U95740	Hs.6349	Homo sapiens, clone IMAGE:3010666, mRNA,	4.04
447568	AF155655	Hs.18885	CGI-116 protein	4.04
452211	AI985513	Hs.233420	ESTs	4.02
443292	AK000213	Hs.9196	hypothetical protein	4.01
420911	U77413	Hs.100293	O-linked N-acetylglucosamine (GlcNAc) tr	4.00
428738	NM_000380	Hs.192803	xeroderma pigmentosum, complementation g	3.95
430456	AA314998	Hs.241503	hypothetical protein	3.95
437531	AI400752	Hs.112259	T cell receptor gamma locus	3.93
428695	AI355647	Hs.189999	purinergic receptor (family A group 5)	3.91
410011	AB020641	Hs.57856	PFTAIRE protein kinase 1	3.91
446494	AA463276	Hs.288906	WW Domain-Containing Gene	3.91
409928	AL137163	Hs.57549	hypothetical protein dJ473B4	3.90
411598	BE336654	Hs.70937	H3 histone family, member A	3.90
425707	AF115402	Hs.11713	E74-like factor 5 (ets domain transcript	3.90
451806	NM_003729	Hs.27076	RNA 3'-terminal phosphate cyclase	3.89
401045				3.89
437372	AA323968	Hs.283631	hypothetical protein DKFZp547G183	3.89
417067	AJ001417	Hs.81086	solute carrier family 22 (extraneuronal	3.88
410467	AF102546	Hs.63931	dachshund (Drosophila) homolog	3.88
431930	AB035301	Hs.272211	cadherin 7, type 2	3.88
453047	AW023798	Hs.286025	ESTs	3.88
401785				3.88
458229	AI929602	Hs.177	phosphatidylinositol glycan, class H	3.86
406414				3.86
412494	AL133900	Hs.792	ADP-ribosylation factor domain protein 1	3.84
418329	AW247430	Hs.84152	cystathionine-beta-synthase	3.83
424850	AA151057	Hs.153498	chromosome 18 open reading frame 1	3.82
427585	D31152	Hs.179729	collagen, type X, alpha 1 (Schmid metaph	3.82
423052	M28214	Hs.123072	RAB3B, member RAS oncogene family	3.82
416111	AA033813	Hs.79018	chromatin assembly factor 1, subunit A (	3.82
419423	D26488	Hs.90315	KIAA0007 protein	3.80
429643	AA455889	Hs.167279	FYVE-finger-containing Rab5 effector pro	3.80
431499	NM_001514	Hs.258561	general transcription factor IIB	3.80
444078	BE246919	Hs.10290	U5 snRNP-specific 40 kDa protein (hPrp8-	3.78
430291	AV660345	Hs.238126	CGI-49 protein	3.76
431637	AI879330	Hs.265960	hypothetical protein FLJ10563	3.74
440411	N30256	Hs.151093	hypothetical protein DKFZp434G1415	3.74
405917				3.74
451230	BE546208	Hs.26090	hypothetical protein FLJ20272	3.73
429597	NM_003816	Hs.2442	a disintegrin and metalloproteinase doma	3.73
415075	L27479	Hs.77889	Friedreich ataxia region gene X123	3.72
440351	AF030933	Hs.7179	RAD1 (S. pombe) homolog	3.70
443603	BE502601	Hs.134289	ESTs, Weakly similar to KIAA1063 protein	3.70
446965	BE242873	Hs.16677	WD repeat domain 15	3.70
412350	AI659306	Hs.73826	protein tyrosine phosphatase, non-recept	3.70
433852	AI378329	Hs.126629	ESTs	3.70
447397	BE247676	Hs.18442	E-1 enzyme	3.68
405718				3.68

425217	AU076696	Hs.155174	CDC5 (cell division cycle 5, S. pombe, h	3.68
421734	AI318624	Hs.107444	Homo sapiens cDNA FLJ20562 fis, clone KA	3.67
427221	L15409	Hs.174007	von Hippel-Lindau syndrome	3.67
402408				3.66
452946	X95425	Hs.31092	EphA5	3.66
419078	M93119	Hs.89584	insulinoma-associated 1	3.66
427144	X95097	Hs.2126	vasoactive intestinal peptide receptor 2	3.65
423396	AI382555	Hs.127950	bromodomain-containing 1	3.65
446320	AF126245	Hs.14791	acyl-Coenzyme A dehydrogenase family, me	3.63
404939				3.62
403137				3.60
437162	AW005505	Hs.5464	thyroid hormone receptor coactivating pr	3.60
404210				3.59
443775	AF291664	Hs.204732	matrix metalloproteinase 26	3.56
452501	AB037791	Hs.29716	hypothetical protein FLJ10980	3.56
422443	NM_014707	Hs.116753	histone deacetylase 7B	3.55
420230	AL034344	Hs.284186	forkhead box C1	3.55
418428	Y12490	Hs.85092	thyroid hormone receptor interactor 11	3.54
433002	AF048730	Hs.279906	cyclin T1	3.53
405793				3.52
457940	AL360159	Hs.306517	Homo sapiens TRipartite motif protein ps	3.52
402444				3.52
418250	U29926	Hs.83918	adenosine monophosphate deaminase (isofo	3.51
414222	AL135173	Hs.878	sorbitol dehydrogenase	3.51
422384	AA224077	Hs.42438	Sm protein F	3.50
447805	AW627932	Hs.19614	gemin4	3.50
454265	H03556	Hs.300949	ESTs, Weakly similar to thyroid hormone	3.50
423445	NM_014324	Hs.128749	alpha-methylacyl-CoA racemase	3.48
413435	X51405	Hs.75360	carboxypeptidase E	3.46
447210	AF035269	Hs.17752	phosphatidylserine-specific phospholipas	3.46
426931	NM_003416	Hs.2076	zinc finger protein 7 (KOX 4, clone HF.1	3.45
408418	AW963897	Hs.44743	KIAA1435 protein	3.45
421887	AW161450	Hs.109201	CGI-86 protein	3.44

Table 7: 42 GENES ENCODING SMALL MOLECULE TARGETS UP-REGULATED IN PROSTATE CANCER COMPARED TO NORMAL ADULT TISSUES

Table 7 shows 42 genes up-regulated in prostate cancer compared to normal adult tissues that are likely to be small molecule targets. These were selected as for Table 5 and the predicted protein contained a structural domain that is indicative of a drugable structure (e.g. protease, kinase, phosphatase, receptor). The functional domain is indicated for each gene.

Pkey: Unique Eos probeset identifier number
ExAccn: Exemplar Accession number, Genbank accession number
UnigeneID: Unigene number
Unigene Title: Unigene gene title
PSDomain: Protein Structural Domain
R1: Ratio of tumor vs. normal tissue

Pkey	ExAccn	UnigeneID	Unigene Title	PSDomain	R1
426747	AA535210	Hs.171995	kallikrein 3, (prostate specific antigen	trypsin	31.80
400299	X07730	Hs.171995	kallikrein 3, (prostate specific antigen	trypsin	24.91
420757	X78592	Hs.99915	androgen receptor (dihydrotestosterone r	Androgen_recep,hormone_rec,zf-C4	19.72
408430	S79876	Hs.44926	dipeptidylpeptidase IV (CD26, adenosine	DPPIV_N_term,Peptidase_S9	16.28
430226	BE245562	Hs.2551	adrenergic, beta-2-, receptor, surface	7tm_1	15.40
411096	U80034	Hs.68583	mitochondrial intermediate peptidase	Peptidase_M3	14.81
440286	U29589	Hs.7138	cholinergic receptor, muscarinic 3	7tm_1	12.04
420381	D50640	Hs.337616	phosphodiesterase 3B, cGMP-inhibited	PDEase	11.10
407021	U52077		gb:Human mariner1 transposase gene, comp	SET,Transposase_1	11.02
401424				arginase	9.58
410001	AB041036	Hs.57771	kallikrein 11	trypsin	9.03
428330	L22524	Hs.2256	matrix metalloproteinase 7 (matrilysin,	Peptidase_M10	8.76
424099	AF071202	Hs.139336	ATP-binding cassette, sub-family C (CFTR	ABC_tran,ABC_membrane	7.64
419991	AJ000098	Hs.94210	eyes absent (Drosophila) homolog 1	Hydrolase	7.20
431992	NM_002742	Hs.2891	protein kinase C, mu	pkinase,DAG_PE-bind,PH	6.49
447359	NM_012093	Hs.18268	adenylate kinase 5	adenylatekinase	6.00
400301	X03635	Hs.1657	estrogen receptor 1	Oest_recep,zf-C4,hormone_rec	5.78
421685	AF189723	Hs.106778	ATPase, Ca++ transporting, type 2C, memb	E1-E2_ATPase,Hydrolase	5.37
444042	NM_004915	Hs.10237	ATP-binding cassette, sub-family G (WHIT	ABC_tran	5.31
447752	M73700	Hs.105938	lactotransferrin	transferrin,7tm_1	5.29
407945	X69208	Hs.606	ATPase, Cu++ transporting, alpha polypep	E1-E2_ATPase,Hydrolase,HMA	5.08
403047				trypsin	4.91
427617	D42063	Hs.199179	RAN binding protein 2	Ran_BP1,zf-RanBP,TPR,pro_isomerase	4.88
422083	NM_001141	Hs.111256	arachidonate 15-lipoxygenase, second typ	lipoxygenase,PLAT	4.82
449535	W15267	Hs.23672	low density lipoprotein receptor-related	ldl_recept_b,ldl_recept_a,EGF	4.82
425071	NM_013989	Hs.154424	deiodinase, iodothyronine, type II	T4_deiodinase	4.32
423740	Y07701	Hs.293007	aminopeptidase puromycin sensitive	Peptidase_M1	4.24
424701	NM_005923	Hs.151988	mitogen-activated protein kinase kinase	pkinase	4.21
424085	NM_002914	Hs.139226	replication factor C (activator 1) 2 (40	AAA,Viral_helicase1	4.20
417531	NM_003157	Hs.1087	serine/threonine kinase 2	pkinase	4.12
428695	AI355647	Hs.189999	purinergic receptor (family A group 5)	7tm_1	3.91
410011	AB020641	Hs.57856	PFTAIRE protein kinase 1	pkinase	3.91
424850	AA151057	Hs.153498	chromosome 18 open reading frame 1	ldl_recept_a	3.82
412350	AI659306	Hs.73826	protein tyrosine phosphatase, non-recept	Y_phosphatase,Band_41,PDZ	3.70
447397	BE247676	Hs.18442	E-1 enzyme	Hydrolase	3.68
452946	X95425	Hs.31092	EphA5	EPH_lbd,fn3,pkinase,SAM	3.66
427144	X95097	Hs.2126	vasoactive intestinal peptide receptor 2	7tm_2	3.65
443775	AF291664	Hs.204732	matrix metalloproteinase 26	Peptidase_M10	3.56
457940	AL360159	Hs.306517	Homo sapiens TRIpartite motif protein ps	SPRY,7tm_1	3.52
418250	U29926	Hs.83918	adenosine monophosphate deaminase (isofo	A_deaminase	3.51
413435	X51405	Hs.75360	carboxypeptidase E	Zn_carbOpept	3.46
447210	AF035269	Hs.17752	phosphatidylserine-specific phospholipas	lipase	3.46

TABLE 8: 136 GENES SIGNIFICANTLY DOWN-REGULATED IN PROSTATE CANCER COMPARED TO NORMAL PROSTATE

Table 8 shows 136 genes significantly down-regulated in prostate cancer compared to normal prostate . These were selected from 59680 probesets on the Affymetrix/Eos Hu03 GeneChip array such that the ratio of "average" normal prostate to "average" prostate cancer tissues was greater than or equal to 2. The "average" normal prostate level was set to the mean amongst 4 normal prostate tissues. The "average" prostate cancer level was set to the 85th percentile amongst 73 tumor samples. In order to remove gene-specific background levels of non-specific hybridization, the 10th percentile value amongst all the tissues was subtracted from both the numerator and the denominator before the ratio was evaluated.

Pkey: Unique Eos probeset identifier number
ExAccn: Exemplar Accession number, Genbank accession number
UnigeneID: Unigene number
Unigene Title: Unigene gene title
R1: Ratio of normal prostate to prostate cancer

Pkey	ExAccn	UnigeneID	Unigene Title	R1
425932	M81650	Hs.1968	semenogelin I	57.69
425545	N98529	Hs.158295	Human mRNA for myosin light chain 3 (MLC	19.70
426752	X69490	Hs.172004	titin	15.25
442082	R41823	Hs.7413	ESTs; calsyntenin-2	10.05
407245	X90568	Hs.172004	titin	9.38
422711	D60641	Hs.21739	Homo sapiens mRNA; cDNA DKFZp586I1518 (f	9.05
420813	X51501	Hs.99949	prolactin-induced protein	8.18
411987	AA375975	Hs.183380	"ESTs, Moderately similar to ALU7_HUMAN	7.45
404567				5.62
416030	H15261	Hs.21948	ESTs	5.51
444892	AI620617	Hs.148565	ESTs	5.27
444573	AW043590	Hs.225023	ESTs	5.20
428068	AW016437	Hs.233462	ESTs	5.08
437440	AA846804	Hs.123694	ESTs	4.95
404113				4.75
452279	AA286844	Hs.61260	hypothetical protein FLJ13164	4.75
421058	AW297967	Hs.188181	ESTs	4.63
445592	AV654382	Hs.17947	"ESTs, Weakly similar to K02F3.10 [C.ele	4.53
405163				4.49
405227				4.45
454059	NM_003154	Hs.37048	statherin	4.45
450152	AI138635	Hs.22968	ESTs	4.40
407013	U35637		"gb:Human nebulin mRNA, partial cds"	4.03
403612				4.02
440089	AA864468	Hs.135646	ESTs	4.00
408988	AL119844	Hs.49476	Homo sapiens clone TUA8 Cri-du-chat regi	3.98
436726	AA324975	Hs.128993	"ESTs, Weakly similar to KIAA0465 protei	3.95
459367	BE148877		"gb:CM4-HT0244-111199-040-h12 HT0244 Hom	3.95
427318	AF186081	Hs.175783	zinc transporter	3.92
411762	AW860972		"gb:QV0-CT0387-180300-167-h07 CT0387 Hom	3.85
418668	AW407987	Hs.87150	Human clone A9A2BR11 (CAC)n/(GTG)n repea	3.75
458311	AF069478		"gb:AF069478 Homo sapiens astrocytoma II	3.61
403649				3.60
419682	H13139	Hs.92282	paired-like homeodomain transcription fa	3.58
412519	AA196241	Hs.73980	"troponin T1, skeletal, slow"	3.51
414206	AW276887	Hs.46609	ESTs	3.45
427419	NM_000200	Hs.177888	histatin 3	3.37
420777	AA280223	Hs.130865	ESTs	3.35
428134	AA421773	Hs.161008	ESTs	3.31
450218	R02018	Hs.168640	"Ank, mouse, homolog of"	3.30
433474	AI192195	Hs.147174	"EST, Highly similar to ubiquitin-protei	3.30
418833	AW974899	Hs.292776	ESTs	3.26
400440	X83957	Hs.83870	nebulin	3.16

413778	AA090235	Hs.75535	*myosin, light polypeptide 2, regulatory	3.06
423151	AW838068		*gb:QV3-LT0048-010300-109-f02 LT0048 Hom	3.05
445060	AA830811	Hs.88808	ESTs	2.98
457065	AI476318	Hs.192480	ESTs	2.95
432456	H00093		*gb:ph8f12u_19/1TV Outward Alu-primed hn	2.92
405678				2.85
406707	S73840	Hs.931	*myosin, heavy polypeptide 2, skeletal m	2.81
444105	AW189097	Hs.166597	ESTs	2.78
433968	AL157518	Hs.90421	PRO2463 protein	2.73
438522	AA809431	Hs.258886	ESTs	2.73
436562	H71937	Hs.169756	"complement component 1, s subcomponent"	2.68
412417	AA102268	Hs.42175	ESTs	2.67
455590	BE072259		*gb:QV4-BT0536-271299-059-g04 BT0536 Hom	2.65
415380	F07953	Hs.16085	putative G-protein coupled receptor	2.65
428729	AL162331	Hs.191436	hypothetical protein FLJ10619	2.64
408537	AW207734		*gb:UI-H-BI2-age-h-01-0-UI.s1 NCI_CGAP_S	2.63
424706	AA741336	Hs.152108	transcriptional unit N143	2.63
413212	BE072092		*gb:PM4-BT0532-160200-003-b11 BT0532 Hom	2.63
406704	M21665	Hs.929	*myosin, heavy polypeptide 7, cardiac mu	2.62
437507	AA758538	Hs.246882	ESTs	2.60
410384	AI933794	Hs.42745	ESTs	2.58
408074	R20723	Hs.124764	ESTs	2.58
436653	AA829828	Hs.292402	ESTs	2.52
458090	AI282149	Hs.56213	*ESTs, Highly similar to FXD3_HUMAN FORK	2.51
432003	AI689154	Hs.122972	ESTs	2.50
436915	AA737400	Hs.142230	ESTs	2.50
410028	AW576454	Hs.258553	ESTs	2.46
448920	AW408009	Hs.22580	alkylglycerone phosphate synthase	2.45
422046	AI638562		*gb:ts50a10.x1 NCI_CGAP_Ut1 Homo sapiens	2.44
451122	AA015767	Hs.193587	ESTs	2.40
422646	H87863	Hs.151380	ESTs	2.36
451237	AW600293		*gb:EST00049 pGEM-T library Homo sapiens	2.36
400001			AFFX control: BioB-3	2.36
415835	Z45365		*gb:HSC2NF061 normalized infant brain cD	2.36
439706	AW872527	Hs.59761	ESTs	2.36
423341	AW242394	Hs.252495	ESTs	2.36
436486	AA742221	Hs.120633	ESTs	2.35
407449	AJ002784		gb:Homo sapiens mRNA; fetal brain cDNA 5	2.33
430573	AA744550	Hs.136345	ESTs	2.32
401974				2.31
443356	AL044498	Hs.133262	*ESTs, Weakly similar to PH0217 reverse	2.31
430751	NM_012471	Hs.247868	transient receptor potential channel 5	2.25
439128	AI949371	Hs.153089	ESTs	2.25
448765	R15337	Hs.21958	*Homo sapiens cDNA FLJ10532 fis, clone N	2.25
451130	AI762250	Hs.211347	ESTs	2.24
405420				2.23
455029	AW851258		*gb:IL3-CT0220-160200-066-H08 CT0220 Hom	2.23
438224	AA933999		*gb:on91f04.s1 Soares_NFL_T_GBC_S1 Homo	2.23
407764	BE008347		*gb:CM0-BN0154-080400-325-h04 BN0154 Hom	2.23
413549	BE252470		*gb:601108292F1 NIH_MGC_16 Homo sapiens	2.23
437010	AA741368	Hs.291434	ESTs	2.23
435111	AI914279	Hs.213740	ESTs	2.22
403375				2.21
455060	AW853441		*gb:RC1-CT0252-030100-023-g09 CT0252 Hom	2.21
409792	AW854153		*gb:RC3-CT0254-060400-029-d03 CT0254 Hom	2.20
421154	AA284333	Hs.287631	*Homo sapiens cDNA FLJ14269 fis, clone P	2.19
401963				2.18
435034	AF168711	Hs.159397	x 010 protein	2.18
448996	AW998989	Hs.105749	KIAA0553 protein	2.18
436816	AW297599	Hs.255667	ESTs	2.17
442252	AI733395	Hs.129124	ESTs	2.17
419310	AA236233	Hs.188716	ESTs	2.16
418579	H91800	Hs.124156	ESTs	2.16
423315	R54109	Hs.26096	ESTs	2.16
432744	AA988835	Hs.38664	ESTs	2.15
424492	AI133482	Hs.165210	ESTs	2.15
424770	AA425562		*gb:zw46e05.r1 Soares_total_fetus_Nb2HF8	2.15
437101	AA744518	Hs.120610	ESTs	2.15
428783	AC004957	Hs.298975	*ESTs, Highly similar to collapsin-2-lik	2.15

415708	H56475		"gb:yt87d11.r1 Soares_pineal_gland_N3HPG	2.13
459619				2.12
427506	AK000134	Hs.179100	hypothetical protein FLJ20127	2.12
452508	AA804174	Hs.184354	ESTs	2.10
410881	AW809157		"gb:RC0-ST0118-041099-031-c07_1 ST0118 Homo sapiens cDNA, mRNA sequence"	2.10
403087				2.10
403869				2.10
445028	D81194	Hs.282499	ESTs	2.10
447884	H29505		"gb:ym60d10.r1 Soares infant brain 1NIB Homo sapiens cDNA clone 5', mRNA sequence"	2.10
414575	H11257	Hs.295233	ESTs	2.09
420351	BE218221	Hs.190044	ESTs	2.08
426998	BE274360		"gb:601121068F1 NIH_MGC_20 Homo sapiens cDNA clone 5', mRNA sequence"	2.08
405455				2.08
423843	AA332652		"gb:EST36627 Embryo, 8 week I Homo sapiens cDNA 5' end similar to similar to monoamine oxidase B, mRNA sequence"	2.08
406135				2.07
427046	BE246180	Hs.121385	ESTs	2.07
403493				2.05
444514	AI682905	Hs.270431	"ESTs, Weakly similar to ALU1_HUMAN ALU SUBFAMILY J SEQUENCE CONTAMINATION WARNING ENTRY [H.sapiens]"	2.05
435884	AA701443	Hs.192868	ESTs	2.05
419629	AB020695	Hs.91662	KIAA0888 protein	2.03
405900				2.03
457350	AW974438	Hs.194136	"ESTs, Moderately similar to AF091457 1 zinc finger protein RIN ZF [R.norvegicus]"	2.02
400007			AFFX control: BioDn-5	2.01
406978	M64358		"gb:Human rhom-3 gene, exon."	2.00

TABLE 8A shows the accession numbers for those primekeys lacking a unigeneID in Table 8. For each probeset we have listed the gene cluster number from which the oligonucleotides were designed. Gene clusters were compiled using sequences derived from Genbank ESTs and mRNAs. These sequences were clustered based on sequence similarity using Clustering and Alignment Tools (DoubleTwist, Oakland California). The Genbank accession numbers for sequences comprising each cluster are listed in the "Accession" column.

Pkey: Unique Eos probeset identifier number
CAT number: Gene cluster number
Accession: Genbank accession numbers

Pkey	CAT number	Accessions
407764	1014849_1	BE008347 BE008320 BE083307 BE083311 AW075988
408537	1064753_1	AW207734 D60164 D81150 D81078 D61356 AW996804
409792	1154677_1	AW854153 AW500210 BE145772 AW501310
410881	1225682_1	AW809157 AW812181 AW812175 AW812172 AW812161 AW812165
411762	1256906_1	AW860972 AW862598 AW862599 AW860988 AW860983 AW860898 AW860925 AW860922 AW860986 AW860984 AW860989
413212	1353792_1	BE072092 BE072106 BE072086 BE072098 BE072103
413549	1375933_2	BE252470 BE147573
415708	1548209_1	H56475 F29401 F34552
415835	1558511_1	Z45365 R25905 H05203 T77496
422046	210744_1	AI638562 T16929 H13401 F07773 R55836
423151	225415_1	AW838068 AW837986 AW838067 AA322487 AW837936
423843	232510_1	AA332652 AA331633 AW999369 AW902993 BE170475 AA378845 AW964175 AI475221
424770	243504_1	AA425562 AI880208 AA346646 N22655 AW811775 AW811786
426998	274259_-1	BE274360
432456	347718_2	H00093 H00079 H00070 H00054 H00049 H00063 AW905306 AW905241 AW905410 AW905307 AW905411 AW905240
AW905210		
		AW905352 AW905304 AW905239 AW905242 AW905243 H00087
438224	452656_1	AA933999 AA781181
447884	740749_1	H29505 R18575 Z43580 T48738 AI435454 BE004683
451237	863269_1	AW600293 AI767468
455029	1249374_1	AW851258 AW851435 AW851106 AW851421
455060	1251259_1	AW853441 BE145228 BE145218 BE145162 BE145283
455590	1335127_1	BE072259 BE072230 BE007911
458311	543550_1	AF069478 AF069479 AF069480

TABLE 8B shows the genomic positioning for those primekeys lacking unigene ID's and accession numbers in table 8. For each predicted exon, we have listed the genomic sequence source used for prediction. Nucleotide locations of each predicted exon are also listed.

Pkey:	Unique number corresponding to an Eos probeset
Ref:	Sequence source. The 7 digit numbers in this column are Genbank Identifier (GI) numbers. "Dunham I. et al." refers to the publication entitled "The DNA sequence of human chromosome 22." Dunham I. et al., Nature (1999) 402:489-495.
Strand:	Indicates DNA strand from which exons were predicted.
Nt_position:	Indicates nucleotide positions of predicted exons.

Pkey	Ref	Strand	Nt_position
401963	3126783	Plus	51382-51521
401974	3126777	Plus	85330-85683
403087	8954241	Plus	169511-169795
403375	9255944	Minus	92554-92795
403493	7341425	Plus	157568-159084
403612	8469060	Minus	94723-94859
403649	8705159	Minus	27141-27247
403869	7280046	Minus	34379-34583
404113	9588571	Minus	13446-13846
404567	7249169	Minus	101320-101501
405163	9966267	Minus	161171-161299
405227	6731245	Minus	22550-22802
405420	7211837	Minus	13428-13582
405455	7656675	Plus	134112-134671
405678	4079670	Plus	151821-152027
405900	6758795	Minus	71181-71535
406135	9164918	Minus	65489-65715

TABLE 9: 1001 GENES SIGNIFICANTLY UP-REGULATED IN NORMAL PROSTATE COMPATED TO PROSTATE CANCER

Table 9 shows 1001 genes significantly up-regulated in prostate cancer compared to normal prostate. These were selected from 59680 probesets on the Affymetrix/Eos Hu03 GeneChip array such that the ratio of "average" normal prostate to "average" prostate cancer tissues was greater than or equal to 8.14. The "average" normal prostate level was set to the mean amongst 4 normal prostate tissues. The "average" prostate cancer level was set to the 85th percentile amongst 73 tumor samples. In order to remove gene-specific background levels of non-specific hybridization, the 10th percentile value amongst all the tissues was subtracted from both the numerator and the denominator before the ratio was evaluated.

Pkey: Unique Eos probeset identifier number
ExAccn: Exemplar Accession number, Genbank accession number
UnigeneID: Unigene number
Unigene Title: Unigene gene title
R1: Ratio of prostate cancer to normal prostate

Pkey	ExAccn	UnigeneID	Unigene Title	R1
451002	AA013299	Hs.8018	ESTs, Weakly similar to ALU3_HUMAN ALU S	1684.00
435596	AA689465	Hs.188999	ESTs	738.00
443576	AI078027	Hs.169338	ESTs	246.86
434247	AA928116	Hs.272065	ESTs	245.20
400452	AK000185		gb:Homo sapiens cDNA FLJ20178 fis, clone	222.00
405932				221.33
427906	AA864330	Hs.166520	ESTs	212.00
443685	AI686550	Hs.174481	ESTs	163.20
451554	AI474866	Hs.193237	ESTs	149.45
418323	NM_002118	Hs.1162	major histocompatibility complex, class	126.11
429480	M36860	Hs.9295	elastin (supravalvular aortic stenosis,	123.27
426025	AW138330	Hs.233778	ESTs	120.00
418917	X02994	Hs.1217	adenosine deaminase	106.75
404407				105.71
442027	AI652926	Hs.128395	ESTs	100.53
433704	AA608684	Hs.121705	ESTs, Moderately similar to ALUC_HUMAN !	94.00
453758	U83527		gb:HSU83527 Human fetal brain (M.Lovett)	89.18
415354	F06495		gb:HSC1AB051 normalized infant brain cDN	87.73
424239	M67439	Hs.143526	dopamine receptor D5	86.82
444143	AW747996	Hs.160999	ESTs	86.43
401672				77.26
430590	AW383947	Hs.246381	CD68 antigen	68.47
411972	BE074959		gb:PM0-BT0582-310100-001-f08 BT0582 Homo	68.00
448992	AI766053	Hs.188346	ESTs	61.26
408828	BE540279		gb:601059857F1 NIH_MGC_10 Homo sapiens c	57.71
409653	AW451693	Hs.220826	ESTs	56.40
402964				54.67
422673	N59027		gb:yv59d11.r1 Soares fetal liver spleen	54.00
422568	AA372275	Hs.279800	Homo sapiens cDNA FLJ11383 fis, clone HE	54.00
438907	R32704	Hs.301298	ESTs	52.96
405172				52.96
444897	AW137088	Hs.144857	ESTs	52.32
458019	AW592931	Hs.256298	ESTs	51.63
405275	AB028989	Hs.88500	mitogen-activated protein kinase 8 inter	50.98
457815	AA703679	Hs.106999	ESTs, Weakly similar to SYT5_HUMAN SYNAP	49.60
424385	AA339666		gb:EST44776 Fetal brain I Homo sapiens c	48.90
407172	T54095		gb:ya92c05.s1 Stratagene placenta (93722	47.98
428202	AA424163	Hs.156895	ESTs	46.83
435672	AI700148	Hs.283626	ESTs	43.57
420283	AA485224	Hs.57734	G protein-coupled receptor kinase-intera	43.00
417016	AA837098	Hs.269933	ESTs	42.70
438854	AF074994	Hs.24240	ESTs	42.67

406134				42.43
457319	AA480895	Hs.201552	ESTs, Weakly similar to T17288 hypotheti	42.31
409314	AA070266		gb:zm69d04.r1 Stratagene neuroepithelium	42.25
401124				41.61
429316	AI371157	Hs.178538	ESTs	40.00
420317	AB006628	Hs.96485	KIAA0290 protein	39.64
457586	AW062439		gb:MR0-CT0060-120899-001-f08 CT0060 Homo	39.60
417407	AA923278	Hs.290905	ESTs, Weakly similar to protease [H.sapi	38.73
430269	BE221682	Hs.178364	ESTs	38.06
439602	W79114	Hs.58558	ESTs	36.69
433686	AA604799	Hs.136528	ESTs, Moderately similar to ALU1_HUMAN A	36.29
417993	AW963705	Hs.295806	ESTs, Weakly similar to ALU7_HUMAN ALU S	36.18
428214	AA936282	Hs.120397	ESTs	36.10
416908	AA333990	Hs.80424	coagulation factor XIII, A1 polypeptide	36.08
426264	BE314852	Hs.168694	hypothetical protein FLJ10257	36.00
415911	H08796	Hs.124952	ESTs	36.00
457502	AA076049	Hs.274415	Homo sapiens cDNA FLJ10229 fis, clone HE	35.23
421566	NM_000399	Hs.1395	early growth response 2 (Krox-20 (Drosop	35.20
401468				34.89
458561	AI220150	Hs.211195	ESTs	34.60
433601	BE350738	Hs.123993	ESTs, Weakly similar to T00366 hypotheti	33.24
454977	AW848032		gb:IL3-CT0214-231299-053-D11 CT0214 Homo	32.96
402828				32.93
414522	AW518944	Hs.76325	Homo sapiens cDNA: FLJ23125 fis, clone L	31.76
402842				31.68
421245	AA285363		gb:HTH280 HTCDL1 Homo sapiens cDNA 5'/3'	31.59
401631	F05183	Hs.1799	CD1D antigen, d polypeptide	31.26
408057	AW139565		gb:UI-H-BI1-aea-d-04-0-UI.s1 NCI_CGAP_Su	31.24
408069	H81795		gb:ys68a10.r1 Soares retina N2b4HR Homo	31.20
438694	T87479	Hs.291797	ESTs	31.09
449156	AF103907	Hs.171353	prostate cancer antigen 3	29.78
428796	AU076734	Hs.193665	solute carrier family 28 (sodium-coupled	29.76
452549	AI907039		gb:PM-BT134-020499-566 BT134 Homo sapien	29.59
410129	BE244074	Hs.285531	regulator of Fas-induced apoptosis	29.53
414464	AI870175	Hs.13957	ESTs	29.47
412326	R07566	Hs.73817	Small inducible cytokine A3 (homologous	29.22
459081	W07808		gb:zb03a12.r1 Soares_fetal_lung_NbHL19W	29.20
448702	AW102670	Hs.122464	ESTs	29.13
451939	U80456	Hs.27311	single-minded (Drosophila) homolog 2	28.74
443412	W84893	Hs.9305	angiotensin receptor-like 1	28.61
457324	AB028990	Hs.243901	KIAA1067 protein	28.24
424247	X14008	Hs.234734	lysozyme (renal amyloidosis)	28.18
457140	AI279960	Hs.178140	ESTs	28.12
444151	AW972917	Hs.128749	alpha-methylacyl-CoA racemase	28.06
457669	AW104257	Hs.123426	ESTs, Weakly similar to putative serine/	27.61
412429	AV650262	Hs.75765	GRO2 oncogene	27.36
405495				27.33
406516				27.25
407997	AW135429	Hs.243577	ESTs	26.96
442115	AW452332	Hs.257554	ESTs	26.36
409038	T97490	Hs.50002	small inducible cytokine subfamily A (Cy	26.34
402836				26.32
449846	AI979284	Hs.200552	ESTs	26.21
417153	X57010	Hs.81343	collagen, type II, alpha 1 (primary oste	26.20
439792	NM_014856	Hs.6684	KIAA0476 gene product	25.91
450096	AI682088	Hs.223368	ESTs	25.60
424196	AL133660	Hs.142926	Homo sapiens mRNA; cDNA DKFZp434M0927 (f	25.57
414246	BE391090	Hs.280278	EST	25.57
420848	NM_005188	Hs.99980	Cas-Br-M (murine) ecotropic retroviral t	25.48
424778	AA251048	Hs.153042	lymphocyte antigen 9	25.42
409126	AA063426		gb:zf70c08.s1 Soares_pineal_gland_N3HPG	25.25
443936	AW083491	Hs.31196	ESTs	25.22
419392	W28573		gb:51f10 Human retina cDNA randomly prim	25.01
411201	T74588	Hs.8509	ESTs, Weakly similar to CO3_HUMAN COMPLE	24.85
422940	BE077458		gb:RC1-BT0606-090500-015-b04 BT0606 Homo	24.76
437571	AA760894	Hs.153023	ESTs	24.74
433973	AI014723	Hs.131770	ESTs	24.57
422416	BE019557	Hs.11900	Human DNA sequence from clone RP4-583P15	24.53
421552	AF026692	Hs.105700	secreted frizzled-related protein 4	24.49

443668	U25758	Hs.134584	ESTs	24.49
424800	AL035588	Hs.153203	MyoD family inhibitor	24.10
453633	AA357001	Hs.34045	hypothetical protein FLJ20764	24.04
430565	AL122081	Hs.244343	cadherin related 23	24.00
433694	AI208611	Hs.12066	Homo sapiens cDNA FLJ11720 fis, clone HE	23.89
451045	AA215672		gb:zr96e09.s1 NCI_CGAP_GCB1 Homo sapiens	23.83
408583	AW449674	Hs.47359	ESTs	23.73
444040	AF204231	Hs.182982	golgin-67	23.62
414182	AA136301		gb:zk93g04.s1 Soares_pregnant_uterus_NbH	23.39
418678	NM_001327	Hs.167379	cancer/testis antigen	23.20
408380	AF123050	Hs.44532	diubiquitin	22.68
456076	BE243877	Hs.76941	ATPase, Na+/K+ transporting, beta 3 poly	22.65
418299	AA279530	Hs.83968	integrin, beta 2 (antigen CD18 (p95), ly	22.38
444917	R68651	Hs.144997	ESTs	22.26
444381	BE387335	Hs.283713	ESTs	22.08
415788	AW628686	Hs.78851	KIAA0217 protein	22.04
410898	AW809637		gb:MR4-ST0124-261099-015-b07 ST0124 Homo	22.00
412978	AI431708	Hs.820	homeo box C6	21.95
458418	AV653846	Hs.126261	Homo sapiens Chromosome 16 BAC clone CIT	21.94
454791	BE071874		gb:RC2-BT0522-120200-014-a06 BT0522 Homo	21.84
408748	J05500	Hs.47431	spectrin, beta, erythrocytic (includes s	21.26
416011	H14487		gb:ym18c10.r1 Soares infant brain 1NIB H	21.24
440474	AI207936	Hs.7195	gamma-aminobutyric acid (GABA) A recepto	21.14
447047	AI623698	Hs.246306	Homo sapiens cDNA: FLJ23529 fis, clone L	21.11
426793	X89887	Hs.172350	HIR (histone cell cycle regulation defec	21.10
409841	AW502139		gb:UI-HF-BR0p-ajr-e-05-0-UI.r1 NIH_MGC_5	21.07
405685				20.90
457359	AI983207	Hs.192481	ESTs, Weakly similar to SYPH_HUMAN SYNAP	20.84
423067	AA321355	Hs.285401	ESTs	20.74
422355	AW403724	Hs.140	immunoglobulin heavy constant gamma 3 (G	20.73
401201				20.73
458278	W28912	Hs.129019	ESTs	20.68
439097	H66948		gb:yr86d10.r1 Soares fetal liver spleen	20.67
414875	H42679	Hs.77522	major histocompatibility complex, class	20.66
400926				20.66
451355	NM_004197	Hs.444	serine/threonine kinase 19	20.64
446982	AW500221	Hs.43616	Homo sapiens mRNA for FLJ00029 protein,	20.61
417105	X60992	Hs.81226	CD6 antigen	20.61
405777				20.51
424123	AW966158	Hs.58582	Homo sapiens cDNA FLJ12702 fis, clone NT	20.20
425009	X58288	Hs.154151	protein tyrosine phosphatase, receptor t	20.10
443271	BE568568	Hs.195704	ESTs	19.98
421064	AI245432	Hs.101382	tumor necrosis factor, alpha-induced pro	19.98
418819	AA228776	Hs.191721	ESTs	19.94
457595	AA584854		gb:no09h11.s1 NCI_CGAP_Phe1 Homo sapiens	19.90
404426				19.84
412571	U43143	Hs.74049	fms-related tyrosine kinase 4	19.79
431457	NM_012211	Hs.256297	integrin, alpha 11	19.62
414002	NM_006732	Hs.75678	FBJ murine osteosarcoma viral oncogene h	19.57
418994	AA296520	Hs.89546	Selectin E (endothelial adhesion molecul	19.56
437158	AW090198	Hs.4779	KIAA1150 protein	19.52
437866	AA156781	Hs.83992	ESTs	19.44
417421	AL138201	Hs.82120	nuclear receptor subfamily 4, group A, m	19.34
433057	X15675	Hs.296832	Human pTR7 mRNA for repetitive sequence	19.22
421730	AW449808	Hs.164036	glucosamine (N-acetyl)-6-sulfatase (Sanf	19.21
456557	AA284477	Hs.96618	ESTs	18.77
440806	AI247422	Hs.129986	ESTs	18.76
439845	AL355743	Hs.56663	Homo sapiens EST from clone 41214, full	18.65
416155	AI807264	Hs.205442	ESTs, Weakly similar to AF117610 1 inner	18.64
437820	AA769062	Hs.16029	ESTs, Weakly similar to alternatively sp	18.62
450923	AW043951	Hs.38449	ESTs	18.59
418329	AW247430	Hs.84152	cystathionine-beta-synthase	18.58
424537	AI673027	Hs.143271	ESTs	18.55
447742	AF113925	Hs.19405	caspase recruitment domain 4	18.52
415251	R42863	Hs.7124	ESTs	18.47
440770	AA912815	Hs.222078	ESTs	18.40
407711	AI085846	Hs.25522	ESTs	18.32
427157	U51166	Hs.173824	thymine-DNA glycosylase	18.28
409847	AW501751	Hs.279733	ESTs	18.15

417240	N57568	Hs.176028	EST	18.13
435732	AF229178	Hs.123136	leucine rich repeat and death domain con	18.12
436896	AW977385	Hs.278615	ESTs	18.12
432485	N90866	Hs.276770	CDW52 antigen (CAMPATH-1 antigen)	17.90
429490	AI971131	Hs.293684	ESTs, Weakly similar to alternatively sp	17.82
429984	AL050102	Hs.227209	DKFZP586F1019 protein	17.82
449214	AI889114	Hs.195663	ESTs	17.75
433867	AK000596	Hs.3618	hippocalcin-like 1	17.72
431735	AW977724	Hs.75968	thymosin, beta 4, X chromosome	17.71
401515				17.67
444045	AI097439	Hs.135548	ESTs	17.58
442754	AL045825	Hs.210197	ESTs	17.55
426559	AB001914	Hs.170414	paired basic amino acid cleaving system	17.54
432415	T16971	Hs.289014	ESTs	17.50
427829	AI188225	Hs.127462	ESTs	17.50
432516	R08003	Hs.188013	ESTs	17.44
435259	AA152106	Hs.4859	cyclin L ania-6a	17.36
414989	T81668		gb:yd29c04.r1 Soares fetal liver spleen	17.31
444880	AW118683	Hs.154150	ESTs	17.30
417651	R06874	Hs.268628	ESTs	17.27
453457	AL037103	Hs.270599	ESTs, Weakly similar to unnamed protein	17.22
424246	AW452533	Hs.143604	Kaiso	17.22
419078	M93119	Hs.89584	insulinoma-associated 1	17.18
417696	BE241624	Hs.82401	CD69 antigen (p60, early T-cell activati	17.14
431117	AF003522	Hs.250500	delta (Drosophila)-like 1	17.14
455254	AW877015		gb:QV2-PT0010-250300-098-f12 PT0010 Homo	17.14
425782	U66468	Hs.159525	cell growth regulatory with EF-hand doma	17.12
426678	H08170	Hs.113755	ESTs	17.12
426403	NM_000361	Hs.2030	thrombomodulin	17.01
425905	AB032959	Hs.161700	KIAA1133 protein	17.00
438867	AW451157	Hs.181157	ESTs	16.98
420940	AA830664	Hs.143974	ESTs	16.94
459234	AI940425		gb:CM0-CT0052-150799-024-c04 CT0052 Homo	16.92
404756				16.91
422247	U18244	Hs.113602	solute carrier family 1 (high affinity a	16.90
420568	F09247	Hs.167399	protocadherin alpha 5	16.88
443559	AI076765	Hs.269899	ESTs	16.80
438703	AI803373	Hs.31599	ESTs	16.78
411424	AW845985		gb:RC2-CT0163-200999-002-H08 CT0163 Homo	16.70
402895				16.69
422538	NM_006441	Hs.118131	5,10-methenyltetrahydrofolate synthetase	16.68
447108	AW449602	Hs.217953	ESTs, Moderately similar to NK-TUMOR REC	16.65
448520	AB002367	Hs.21355	doublecortin and CaM kinase-like 1	16.54
438567	AW451955	Hs.153065	ESTs	16.52
407811	AW190902	Hs.40098	cysteine knot superfamily 1, BMP antagon	16.50
410721	R23534	Hs.2730	heterogeneous nuclear ribonucleoprotein	16.50
437133	AB018319	Hs.5460	KIAA0776 protein	16.40
408182	AA047854		gb:zf49g04.r1 Soares retina N2b4HR Homo	16.32
417315	AI080042	Hs.180450	ribosomal protein S24	16.30
431840	AA534908	Hs.2860	POU domain, class 5, transcription facto	16.28
439882	AA847856	Hs.124565	ESTs	16.20
418277	AW135221	Hs.130812	ESTs	16.09
410688	AW796342		gb:PM2-UM0027-230200-002-h02 UM0027 Homo	16.04
420120	AL049610	Hs.95243	transcription elongation factor A (SII)-	16.04
429597	NM_003816	Hs.2442	a disintegrin and metalloproteinase doma	16.02
447033	AI357412	Hs.157601	EST - not in UniGene	16.02
421684	BE281591	Hs.106768	hypothetical protein FLJ10511	15.94
408599	AA055800	Hs.222933	ESTs	15.93
446012	AV656098	Hs.172382	hypothetical protein FLJ20001	15.86
409671	AA076769		gb:7B02B10 Chromosome 7 Fetal Brain cDNA	15.85
405934				15.84
426108	AA622037	Hs.168468	programmed cell death 5	15.84
418208	AW291168	Hs.41295	ESTs	15.48
410708	AA534370	Hs.154088	Homo sapiens cDNA: FLJ22756 fis, clone K	15.42
447342	AI199268	Hs.19322	ESTs; Weakly similar to !!!! ALU SUBFAMI	15.38
454563	AW807530		gb:CM0-ST0081-130999-054-d02 ST0081 Homo	15.37
411507	AW850140		gb:IL3-CT0219-261099-023-D11 CT0219 Homo	15.36
438170	AI918685	Hs.194601	ESTs	15.29
416292	AA179233	Hs.42390	nasopharyngeal carcinoma susceptibility	15.26

406638	M13861		gb:Human T-cell receptor active beta-cha	15.26
446686	AW138043	Hs.156307	ESTs	15.25
434485	AI623511	Hs.118567	ESTs	15.24
441188	AW292830	Hs.255609	ESTs	15.22
444172	BE147740	Hs.104558	ESTs	15.22
409521	BE244854	Hs.159578	Homo sapiens mRNA for FLJ00020 protein,	15.16
420748	AA279956	Hs.88672	ESTs	15.14
422583	AA410506	Hs.118578	H.sapiens mRNA for ribosomal protein L18	15.14
424240	AB023185	Hs.143535	calcium/calmodulin-dependent protein kin	15.12
451118	AI862096	Hs.60640	ESTs	15.12
437495	BE177778		gb:RC1-HT0598-310300-012-f07 HT0598 Homo	15.12
445467	AI239832	Hs.15617	ESTs, Weakly similar to ALU4_HUMAN ALU S	15.06
418305	AW006783	Hs.6686	ESTs	15.03
402812				15.02
436851	AA732480	Hs.293581	ESTs	15.00
400991				15.00
415752	BE314524	Hs.78776	Human putative transmembrane protein (nm	14.96
429900	AA460421	Hs.30875	ESTs	14.90
403683				14.84
430315	NM_004293	Hs.239147	guanine deaminase	14.80
451952	AL120173	Hs.301663	ESTs	14.72
424687	J05070	Hs.151738	matrix metalloproteinase 9 (gelatinase B	14.69
447229	BE617135		gb:601441677F1 NIH_MGC_65 Homo sapiens c	14.67
425818	AB021225	Hs.159581	matrix metalloproteinase 17 (membrane-in	14.65
448553	AI638449	Hs.173031	ESTs	14.63
431089	BE041395	Hs.283676	ESTs, Weakly similar to unknown protein	14.60
459145	AI903354		gb:RC-BT029-100199-117 BT029 Homo sapien	14.55
449650	AF055575	Hs.297647	ESTs, Moderately similar to calcium chan	14.54
400952				14.46
445885	AI734009	Hs.127699	EST cluster (not in UniGene)	14.44
407938	AA905097	Hs.85050	phospholamban	14.42
431676	AI685464	Hs.292638	ESTs	14.40
437210	AA311443	Hs.293563	Homo sapiens mRNA; cDNA DKFZp586E2317 (f	14.36
451900	AB023199	Hs.27207	KIAA0982 protein	14.36
445800	AA126419	Hs.301632	ESTs	14.32
412368	AW945992	Hs.181125	immunoglobulin lambda locus	14.31
409055	AW304028	Hs.300578	ESTs	14.23
408763	W57550	Hs.301526	Homo sapiens cDNA FLJ13181 fis, clone NT	14.22
446734	AL049278	Hs.16074	Homo sapiens mRNA; cDNA DKFZp564I153 (fr	14.22
413551	BE242639	Hs.75425	ubiquitin associated protein	14.22
421913	AI934365	Hs.109439	osteoglycin (osteoinductive factor, mime	14.22
452712	AW838616		gb:RC5-LT0054-140200-013-D01 LT0054 Homo	14.22
451468	AW503398	Hs.210047	ESTs	14.16
406038	Y14443	Hs.88219	zinc finger protein 200	14.14
424909	S78187	Hs.153752	cell division cycle 25B	14.07
434078	AW880709	Hs.283683	EST	14.07
415254	AI815831	Hs.184378	ESTs	14.05
418196	AI745649	Hs.26549	ESTs, Weakly similar to T00066 hypotheti	14.02
410020	T86315	Hs.728	ribonuclease, RNase A family, 2 (liver,	13.98
411352	NM_002890	Hs.758	RAS p21 protein activator (GTPase activa	13.98
429848	AF145439	Hs.225946	chemokine (C-C motif) receptor 9	13.95
413729	BE159999		gb:QV1-HT0412-270300-123-d10 HT0412 Homo	13.90
400125				13.88
420319	AW406289	Hs.96593	hypothetical protein	13.85
448272	AI479094	Hs.170786	ESTs	13.80
422695	AA315158		gb:EST186956 HCC cell line (matastasis t	13.80
424565	AW102723	Hs.75295	guanylate cyclase 1, soluble, alpha 3	13.78
458048	H30340	Hs.173705	Homo sapiens cDNA: FLJ22050 fis, clone H	13.78
408894	AI935400	Hs.217286	ESTs	13.76
454093	AW860158		gb:RC0-CT0379-290100-032-b04 CT0379 Homo	13.75
410889	X91662	Hs.66744	twist (Drosophila) homolog (acrocephalos	13.74
457751	AI908236		gb:IL-BT166-180399-010 BT166 Homo sapien	13.72
455131	AW857913		gb:RC0-CT0323-231199-031-b05 CT0323 Homo	13.69
408364	AW015238	Hs.128453	ESTs	13.67
425907	AA365752	Hs.155965	ESTs	13.62
402359				13.60
401044				13.53
409877	AW502498	Hs.157150	ESTs, Weakly similar to zinc finger prot	13.53
423690	AA329648	Hs.23804	ESTs	13.49

430685	AI690234	Hs.191666	ESTs, Weakly similar to reverse transcri	13.47
414052	AW578849	Hs.283552	ESTs, Weakly similar to unnamed protein	13.46
447858	AW080339	Hs.211911	ESTs	13.44
435716	AI573283	Hs.38458	ESTs	13.44
439120	H56389		gb:yt87c03.r1 Soares_pineal_gland_N3HPG	13.43
402788				13.40
451591	AA886446	Hs.146278	ESTs	13.40
405411				13.38
426558	AW188574	Hs.24218	ESTs	13.34
453506	AA132818	Hs.110407	ESTs, Weakly similar to coded for by C.	13.33
416445	AL043004	Hs.300678	Human serine/threonine kinase mRNA, part	13.32
457084	AI074149	Hs.150905	ESTs, Weakly similar to chondroitin 4-su	13.32
403838				13.32
427337	Z46223	Hs.176663	Fc fragment of IgG, low affinity IIb, r	13.30
434318	AW207552	Hs.116328	ESTs, Weakly similar to dJ134E15.1 [H.sa	13.28
435193	N41359	Hs.218107	ESTs	13.28
414756	AW451101	Hs.159489	ESTs, Moderately similar to hexokinase I	13.27
420626	AF043722	Hs.99491	RAS guanyl releasing protein 2 (calcium	13.26
420052	AA418850	Hs.44410	ESTs	13.25
414020	NM_002984	Hs.75703	small inducible cytokine A4 (homologous	13.25
403851				13.24
422647	W07492	Hs.157101	ESTs	13.21
433598	AI762836	Hs.271433	ESTs, Moderately similar to ALU2_HUMAN A	13.21
409065	AB033113	Hs.50187	KIAA1287 protein	13.20
435063	R21966	Hs.57734	G protein-coupled receptor kinase-intera	13.19
439367	BE386844	Hs.248746	ESTs	13.17
451957	AI796320	Hs.10299	Homo sapiens cDNA FLJ13545 fis, clone PL	13.16
420569	AA278362	Hs.289062	Homo sapiens cDNA FLJ12334 fis, clone MA	13.14
447883	BE262802	Hs.4909	dickkopf (Xenopus laevis) homolog 3	13.07
426490	NM_001621	Hs.170087	aryl hydrocarbon receptor	13.06
414789	AA155859	Hs.79708	ESTs	13.05
451418	BE387790	Hs.26369	ESTs	13.04
443494	T99719	Hs.270404	Homo sapiens cDNA: FLJ22389 fis, clone H	13.03
425878	AW964806	Hs.38085	ESTs, Weakly similar to putative glycine	13.02
431912	AI660552	Hs.154903	ESTs, Weakly similar to A56154 Abl subst	13.00
407122	H20276	Hs.31742	ESTs	13.00
456491	AL137468	Hs.97277	Homo sapiens mRNA; cDNA DKFZp434H1322 (f	12.99
448172	N75276	Hs.135904	ESTs	12.98
452144	AA032197	Hs.102558	ESTs	12.96
419953	BE267154	Hs.125752	ESTs	12.96
416182	NM_004354	Hs.79069	cyclin G2	12.94
451154	AA015879	Hs.33536	ESTs	12.93
412257	AW903830		gb:CM4-NN1037-250400-155-h04 NN1037 Homo	12.93
449784	AW161319	Hs.12915	ESTs	12.92
432695	D63480	Hs.278634	KIAA0146 protein	12.92
454105	NM_001259	Hs.38481	cyclin-dependent kinase 6	12.92
439093	AA534163	Hs.5476	serine protease inhibitor, Kazal type, 5	12.90
416098	H41324	Hs.31581	ESTs, Moderately similar to ST1B_HUMAN S	12.88
424897	D63216	Hs.153684	frizzled-related protein	12.88
414604	AU076649	Hs.76556	growth arrest and DNA-damage-inducible 3	12.88
414684	AA587775	Hs.66295	Homo sapiens HSPC311 mRNA, partial cds	12.84
452560	BE077084		gb:RC5-BT0603-220200-013-C07 BT0603 Homo	12.84
413869	NM_000878	Hs.75596	interleukin 2 receptor, beta	12.80
452359	BE167229	Hs.29206	Homo sapiens clone 24659 mRNA sequence	12.80
435886	BE265839	Hs.12126	hepatocellular carcinoma-associated anti	12.78
445230	U97018	Hs.12451	echinoderm microtubule-associated protei	12.78
412226	W26786		gb:15d7 Human retina cDNA randomly prime	12.77
446619	AU076643	Hs.313	secreted phosphoprotein 1 (osteopontin,	12.76
447769	AW873704	Hs.48764	ESTs	12.76
414478	AI306389	Hs.76240	adenylate kinase 1	12.76
425383	D83407	Hs.156007	Down syndrome critical region gene 1-lik	12.68
450704	H85157	Hs.40696	ESTs	12.66
405856				12.66
412935	BE267045	Hs.75064	tubulin-specific chaperone c	12.65
402802				12.62
452588	AA889120	Hs.110637	Homeo box A10	12.62
419978	NM_001454	Hs.93974	forkhead box J1	12.62
403137				12.60
430226	BE245562	Hs.2551	adrenergic, beta-2-, receptor, surface	12.57

448076	AJ133123	Hs.20196	adenylate cyclase 9	12.56
450462	F07097	Hs.300828	Homo sapiens mRNA full length insert cDN	12.54
405236				12.52
409292	AA071051		gb:zm58e05.s1 Stratagene fibroblast (937	12.47
421540	AA767669	Hs.10242	ESTs	12.47
425840	AW978731	Hs.301824	ESTs	12.44
443181	AI039201	Hs.54548	ESTs	12.42
452436	BE077546	Hs.31447	ESTs	12.42
455183	AW984111		gb:RC0-HN0007-160300-011-f09 HN0007 Homo	12.40
432887	AI926047	Hs.162859	ESTs	12.37
410494	M36564	Hs.64016	protein S (alpha)	12.36
439024	R96696	Hs.35598	ESTs	12.36
451246	AW189232	Hs.39140	cutaneous T-cell lymphoma tumor antigen	12.36
432892	AL042615	Hs.15995	ESTs	12.35
418982	AI348838	Hs.13073	ESTs	12.35
414516	AI307802	Hs.279551	ESTs	12.34
440134	BE410734		gb:601301619F1 NIH_MGC_21 Homo sapiens c	12.29
443873	AL048542	Hs.16291	ESTs	12.28
401286				12.26
454020	AW962845	Hs.256527	ESTs	12.24
420077	AW512260	Hs.87767	ESTs	12.24
443837	AI984625	Hs.9884	spindle pole body protein	12.24
407519	X64979		gb:H.sapiens mRNA HTPCRX01 for olfactory	12.23
435839	AF249744	Hs.25951	Rho guanine nucleotide exchange factor (	12.22
448552	AW973653	Hs.20104	hypothetical protein FLJ00052	12.20
405325				12.20
451009	AA013140	Hs.115707	ESTs	12.18
423066	Y18264	Hs.120171	ESTs	12.17
439556	AI623752	Hs.163603	ESTs	12.16
443062	N77999	Hs.8963	Homo sapiens mRNA full length insert cDN	12.15
445873	AA250970	Hs.251946	Homo sapiens cDNA: FLJ23107 fis, clone L	12.14
453542	AW836724	Hs.33190	Homo sapiens mRNA expressed only in plac	12.11
440106	AA864968	Hs.127699	ESTs	12.10
417605	AF006609	Hs.82294	regulator of G-protein signalling 3	12.10
440286	U29589	Hs.7138	cholinergic receptor, muscarinic 3	12.04
420061	AW024937	Hs.29410	ESTs	12.02
458727	AI022813	Hs.92679	Homo sapiens clone CDABP0014 mRNA sequen	11.96
445407	AI222658	Hs.221889	ESTs, Weakly similar to la costa [D.mela	11.95
418250	U29926	Hs.83918	adenosine monophosphate deaminase (isofo	11.94
414129	AI990287	Hs.270798	ESTs	11.93
409799	D11928	Hs.76845	phosphoserine phosphatase-like	11.92
438461	AW075485	Hs.286049	phosphoserine aminotransferase	11.92
443912	R37257	Hs.184780	ESTs	11.92
424606	AA343936		gb:EST49786 Gall bladder I Homo sapiens	11.90
434217	AW014795	Hs.23349	ESTs	11.90
451533	NM_004657	Hs.26530	serum deprivation response (phosphatidyl	11.90
422423	AF283777	Hs.116481	CD72 antigen	11.89
409398	AW386461		gb:PM4-PT0019-121299-004-F02 PT0019 Homo	11.89
423853	AB011537	Hs.133466	slit (Drosophila) homolog 1	11.82
446180	AI074413	Hs.14220	hypothetical protein FLJ20450	11.80
414341	D80004	Hs.75909	KIAA0182 protein	11.80
406538				11.79
433253	AW450502	Hs.24218	ESTs	11.79
447397	BE247676	Hs.18442	E-1 enzyme	11.78
451684	AF216751	Hs.26813	CDA14	11.76
416862	R23765	Hs.23575	ESTs	11.74
425770	NM_014363	Hs.159492	spastic ataxia of Charlevoix-Saguenay (s	11.72
428826	AL048842	Hs.194019	attractin	11.72
433037	NM_014158	Hs.279938	HSPC067 protein	11.72
447476	BE293466	Hs.20880	ESTs	11.72
452092	BE245374	Hs.27842	hypothetical protein FLJ11210	11.72
412922	M60721	Hs.74870	H2.0 (Drosophila)-like homeo box 1	11.72
401680	NM_005578	Hs.180398	LIM domain-containing preferred transloc	11.69
422576	BE548555	Hs.118554	CGI-83 protein	11.68
450203	AF097994	Hs.301528	L-kynurenine/alpha-aminoadipate aminotra	11.68
410531	AW752953		gb:QV0-CT0224-261099-035-g02 CT0224 Homo	11.67
425917	W28517	Hs.117167	Homo sapiens cDNA: FLJ23067 fis, clone L	11.66
418693	AI750878	Hs.87409	thrombospondin 1	11.64
400557				11.62

416188	BE157260	Hs.79070	v-myc avian myelocytomatosis viral oncog	11.60
419047	AW952771	Hs.90043	ESTs	11.59
420441	AI986160	Hs.88446	ESTs	11.59
400885				11.57
409853	AW502327		gb:UI-HF-BR0p-aka-a-07-0-UI.r1 NIH_MGC_5	11.56
400802				11.56
434540	NM_016045	Hs.5184	TH1 drosophila homolog	11.55
431449	M55994	Hs.256278	tumor necrosis factor receptor superfami	11.55
425928	S55736	Hs.238852	ESTs, Weakly similar to hypothetical pro	11.54
434701	AA460479	Hs.4096	KIAA0742 protein	11.53
434228	Z42047	Hs.283978	ESTs; KIAA0738 gene product	11.52
420729	AW964897	Hs.290825	ESTs	11.52
428328	AA426080	Hs.98489	ESTs	11.50
433887	AW204232	Hs.279522	ESTs	11.50
414812	X72755	Hs.77367	monokine induced by gamma interferon	11.46
457718	F18572	Hs.22978	ESTs	11.44
452260	AA453208	Hs.28726	RAB9, member RAS oncogene family	11.42
459029	AA131376	Hs.285203	fibroblast growth factor 12	11.42
456267	AI127958	Hs.83393	cystatin E/M	11.39
433285	AW975944	Hs.237396	ESTs	11.38
449186	AW291876	Hs.196986	ESTs	11.37
447861	AI434593	Hs.164294	ESTs	11.37
456023	R00028		gb:ye70a06.s1 Soares fetal liver spleen	11.36
439444	AI277652	Hs.54578	ESTs	11.31
401163				11.31
430886	L36149	Hs.248116	chemokine (C motif) XC receptor 1	11.28
450784	AW246803	Hs.47289	ESTs	11.28
452391	AL044829	Hs.29331	carnitine palmitoyltransferase I, muscle	11.27
449625	NM_014253	Hs.23796	odz (odd Oz/ten-m, Drosophila) homolog 1	11.26
456827	AA075687	Hs.147176	epidermal growth factor receptor substra	11.24
439328	W07411	Hs.118212	ESTs, Moderately similar to ALU3_HUMAN A	11.24
432093	H28383		gb:yl52c03.r1 Soares breast 3NbHBst Homo	11.24
407335	AA631047	Hs.158761	Homo sapiens cDNA FLJ13054 fis, clone NT	11.23
442501	AA315267	Hs.23128	ESTs	11.22
429746	AJ237672	Hs.214142	5,10-methylenetetrahydrofolate reductase	11.21
422858	R35398		gb:yg64g10.r1 Soares infant brain 1NIB H	11.20
415156	X84908	Hs.78060	phosphorylase kinase, beta	11.20
446713	AV660122	Hs.282675	ESTs	11.20
452221	C21322	Hs.11577	ESTs	11.20
418261	W78902	Hs.293297	ESTs	11.17
433332	AI367347	Hs.127809	ESTs	11.16
434539	AW748078	Hs.214410	ESTs	11.16
413471	BE142098		gb:CM4-HT0137-220999-017-d11 HT0137 Homo	11.14
410037	AB020725	Hs.58009	KIAA0918 protein	11.14
405601				11.13
458332	AI000341	Hs.220491	ESTs	11.12
427654	AA410183	Hs.137475	ESTs	11.12
427138	N77624	Hs.173717	phosphatidic acid phosphatase type 2B	11.10
431475	AI567669	Hs.287316	ESTs	11.10
425710	AF030880	Hs.159275	solute carrier family, member 4	11.08
413748	AW104057	Hs.19193	ESTs	11.07
409208	Y00093	Hs.51077	integrin, alpha X (antigen CD11C (p150),	11.07
457278	W92745	Hs.193324	ESTs	11.03
407021	U52077		gb:Human mariner1 transposase gene, comp	11.02
445701	AF055581	Hs.13131	lymphocyte adaptor protein	11.02
408338	AW867079		gb:MR1-SN0033-120400-002-c10 SN0033 Homo	10.95
401030	BE382701	Hs.25960	v-myc avian myelocytomatosis viral relat	10.95
437891	AW006969	Hs.6311	hypothetical protein FLJ20859	10.94
453874	AW591783	Hs.36131	collagen, type XIV, alpha 1 (undulin)	10.94
421562	AA530994	Hs.105803	ghrelin precursor	10.92
413431	AW246428	Hs.75355	ubiquitin-conjugating enzyme E2N (homolo	10.92
400132				10.92
436420	AA443966	Hs.31595	ESTs	10.90
424880	NM_000328	Hs.153614	retinitis pigmentosa GTPase regulator	10.88
433264	D85782	Hs.3229	cysteine dioxygenase, type I	10.88
429842	AI366213	Hs.173422	KIAA1605 protein	10.87
412405	AW948126		gb:RC0-MT0013-280300-031-a12 MT0013 Homo	10.85
400615				10.80
425018	BE245277	Hs.154196	E4F transcription factor 1	10.80

456011	BE243628		gb:TCBAP1D1053 Pediatric pre-B cell acut	10.79
455982	BE176862		gb:RC4-HT0587-170300-012-a04 HT0587 Homo	10.74
450418	BE218418	Hs.201802	ESTs	10.73
412490	AW803564	Hs.288850	ESTs	10.72
436982	AW377314	Hs.5364	DKFZP564I052 protein	10.70
437743	AI383497	Hs.131811	ESTs, Weakly similar to ALU1_HUMAN ALU S	10.70
449967	R40978	Hs.271498	ESTs, Moderately similar to ALU1_HUMAN A	10.70
449590	AA694070	Hs.268835	ESTs	10.68
446035	NM_006558	Hs.13565	Sam68-like phosphotyrosine protein, T-ST	10.68
426530	U24578	Hs.170250	complement component 4A	10.66
428600	AW863261	Hs.15036	ESTs, Highly similar to AF161358 1 HSPC0	10.64
420090	AA220238	Hs.94986	ribonuclease P (38kD)	10.64
451593	AF151879	Hs.26706	CGI-121 protein	10.62
438893	AF075031	Hs.29327	ESTs	10.62
459324	AW080953		gb:xc28c12.x1 NCI_CGAP_Co18 Homo sapiens	10.61
439883	AL359652	Hs.171096	Homo sapiens EST from clone DKFZp434A041	10.58
406513	AA715328	Hs.291205	ESTs	10.57
407826	AA128423	Hs.40300	calpain 3, (p94)	10.57
419550	D50918	Hs.90998	KIAA0128 protein; septin 2	10.56
428522	R10184	Hs.191987	ESTs, Weakly similar to ALU1_HUMAN ALU S	10.56
459526	AI142350	Hs.146735	EST	10.55
411448	AA178955	Hs.271439	ESTs	10.54
410102	AW248508	Hs.279727	ESTs;	10.52
406577				10.52
408405	AK001332	Hs.44672	hypothetical protein FLJ10470	10.51
428966	AF059214	Hs.194687	cholesterol 25-hydroxylase	10.50
400880				10.48
415875	AA894876	Hs.5687	protein phosphatase 1B (formerly 2C), ma	10.48
434715	BE005346	Hs.116410	ESTs	10.46
406851	AA609784	Hs.180255	major histocompatibility complex, class	10.44
413409	AI638418	Hs.21745	ESTs	10.44
418489	U76421	Hs.85302	adenosine deaminase, RNA-specific, B1 (h	10.44
419465	AW500239	Hs.21187	Homo sapiens cDNA: FLJ23068 fis, clone L	10.44
419544	AI909154		gb:QV-BT200-010499-007 BT200 Homo sapien	10.44
432180	Y18418	Hs.272822	RuvB (E coli homolog)-like 1	10.44
413822	R08950	Hs.272044	ESTs, Weakly similar to ALU1_HUMAN ALU S	10.42
437446	AA788946	Hs.16869	ESTs, Moderately similar to CA1C RAT COL	10.41
415701	NM_003878	Hs.78619	gamma-glutamyl hydrolase (conjugase, fol	10.41
443790	NM_003500	Hs.9795	acyl-Coenzyme A oxidase 2, branched chai	10.40
458873	AW150717	Hs.296176	STAT induced STAT inhibitor 3	10.38
415082	AA160000	Hs.137396	ESTs	10.37
429124	AW505086	Hs.196914	minor histocompatibility antigen HA-1	10.36
417187	AB011151	Hs.81505	KIAA0579 protein	10.34
426827	AW067805	Hs.172665	methylenetetrahydrofolate dehydrogenase	10.34
424280	NM_000030	Hs.271366	alanine-glyoxylate aminotransferase homo	10.33
446099	T93096	Hs.17126	ESTs	10.32
423445	NM_014324	Hs.128749	alpha-methylacyl-CoA racemase	10.31
409995	AW960597	Hs.30164	ESTs	10.30
432242	AW022715	Hs.162160	ESTs, Weakly similar to ALU4_HUMAN ALU S	10.30
406394	AA172106	Hs.110950	Rag C protein	10.30
406189				10.29
422283	AW411307	Hs.114311	CDC45 (cell division cycle 45, S.cerevis	10.26
401598	AA172106	Hs.110950	Rag C protein	10.26
456995	T89832	Hs.170278	ESTs	10.26
416511	NM_006762	Hs.79356	Lysosomal-associated multispanning membr	10.24
427274	NM_005211	Hs.174142	colony stimulating factor 1 receptor, fo	10.24
401384				10.23
456226	D13168	Hs.82002	endothelin receptor type B	10.22
426928	AF037062	Hs.172914	retinol dehydrogenase 5 (11-cisand 9-cis	10.21
423032	AI684746	Hs.119274	ESTs	10.20
436556	AI364997	Hs.7572	ESTs	10.20
418400	BE243026	Hs.301989	KIAA0246 protein	10.19
437401	AA757196	Hs.121190	ESTs	10.19
403690				10.17
423790	BE152393		gb:CM2-HT0323-171199-033-a08 HT0323 Homo	10.16
434094	AA305599	Hs.238205	hypothetical protein PRO2013	10.16
434967	AW975009	Hs.292274	ESTs	10.16
432827	Z68128	Hs.3109	Rho GTPase activating protein 4	10.16
432660	AI288430	Hs.64004	ESTs	10.14

452234	AW084176	Hs.223296	ESTs	10.14
445629	AI245701		gb:qk31f05.x1 NCI_CGAP_Kid3 Homo sapiens	10.13
457236	AA626142	Hs.179991	ESTs, Weakly similar to KPCE_HUMAN PROTE	10.13
444605	AI174603	Hs.254105	enolase 1, (alpha)	10.12
450313	AI038989	Hs.24809	hypothetical protein FLJ10826	10.12
407482	NM_006056			10.12
449971	AA807346	Hs.288581	Homo sapiens cDNA FLJ14296 fis, clone PL	10.11
441201	AW118822	Hs.128757	ESTs	10.10
435157	AW014605	Hs.179872	ESTs	10.10
417308	H60720	Hs.81892	KIAA0101 gene product	10.09
442582	AI204266	Hs.179303	ESTs	10.05
437252	AI433833	Hs.164159	ESTs, Weakly similar to ALU1_HUMAN ALU S	10.04
448663	BE614599	Hs.106823	H.sapiens gene from PAC 42616, similar t	10.04
434467	BE552368	Hs.231853	Homo sapiens cDNA FLJ13445 fis, clone PL	10.04
423698	AA329796	Hs.1098	DKFZp434J1813 protein	10.02
412707	AW206373	Hs.16443	Homo sapiens cDNA: FLJ21721 fis, clone C	10.00
414658	X58528	Hs.76781	ATP-binding cassette, sub-family D (ALD)	10.00
421832	NM_016098	Hs.108725	HSPC040 protein	10.00
423554	M90516	Hs.1674	glutamine-fructose-6-phosphate transamin	10.00
452039	AI922988	Hs.172510	ESTs	10.00
434673	AW137442	Hs.136965	ESTs	10.00
427978	AA418280	Hs.180040	Homo sapiens cDNA: FLJ22439 fis, clone H	10.00
457803	BE501815	Hs.198011	ESTs	9.99
428279	AA425310	Hs.155766	ESTs	9.98
444412	AI147652	Hs.216381	Homo sapiens clone HH409 unknown mRNA	9.98
417049	N72394	Hs.44862	ESTs	9.96
427509	M62505	Hs.2161	complement component 5 receptor 1 (C5a l	9.96
445424	AB028945	Hs.12696	cortactin SH3 domain-binding protein	9.96
443678	AW009605	Hs.231923	ESTs	9.96
447567	AW474513	Hs.224397	ESTs, Weakly similar to B48013 proline-r	9.94
414709	AA704703	Hs.77031	Sp2 transcription factor	9.94
434596	T59538		gb:yb65g12.s1 Stratagene ovary (937217)	9.94
427630	BE276115	Hs.144980	ESTs, Weakly similar to CA13_HUMAN COLLA	9.93
416111	AA033813	Hs.79018	chromatin assembly factor 1, subunit A (	9.92
423349	AF010258	Hs.127428	homeo box A9	9.92
424308	AW975531	Hs.154443	minichromosome maintenance deficient (S.	9.92
416814	AW192307	Hs.80042	dolichyl-P-Glc:Man9GlcNAc2-PP-dolichylgl	9.90
417986	AA481003	Hs.97128	ESTs	9.90
425174	D87450	Hs.154978	KIAA0261 protein	9.90
438171	AW976507	Hs.293515	ESTs	9.90
421984	AW972187	Hs.110443	hypothetical protein FLJ22215	9.89
408597	NM_005291	Hs.46453	G protein-coupled receptor 17	9.88
413907	AI097570	Hs.71222	ESTs	9.87
451296	AW801383	Hs.118578	H.sapiens mRNA for ribosomal protein L18	9.86
433409	AI278802	Hs.25661	ESTs	9.85
450360	AW117416	Hs.245484	ESTs	9.85
433104	AL043002	Hs.128246	ESTs, Moderately similar to unnamed prot	9.84
449824	AI962552	Hs.226765	ESTs	9.84
452744	AI267652	Hs.30504	Homo sapiens mRNA; cDNA DKFZp434E082 (fr	9.82
431066	AF026273	Hs.249175	interleukin-1 receptor-associated kinase	9.82
426457	AW894687	Hs.169965	chimerin (chimaerin) 1	9.80
443371	AI792888	Hs.145489	ESTs	9.80
437159	AL050072		gb:Homo sapiens mRNA; cDNA DKFZp566E1346	9.75
425242	D13635	Hs.155287	KIAA0010 gene product	9.74
447498	N67619	Hs.43687	ESTs	9.74
426759	AI590401	Hs.21213	ESTs	9.73
435129	AI381659	Hs.267086	ESTs	9.72
437672	AW748265	Hs.5741	flavohemoprotein b5+b5R	9.72
438209	AL120659	Hs.6111	KIAA0307 gene product	9.72
438440	AA807228	Hs.225161	ESTs	9.72
449720	AA311152	Hs.288708	ESTs; Weakly similar to KIAA0226 [H.sapi	9.72
414291	AI289619	Hs.13040	ESTs	9.72
436206	AK001451	Hs.265561	CD2-associated protein	9.70
446896	T15767	Hs.22452	Homo sapiens cDNA: FLJ21084 fis, clone C	9.70
412667	AW977540	Hs.269254	ESTs	9.70
423301	S67580	Hs.1645	cytochrome P450, subfamily IVA, polypept	9.67
440757	AW118645	Hs.160004	ESTs	9.67
441412	AI393657	Hs.159750	ESTs	9.66
421044	AF061871	Hs.101302	collagen, type XII, alpha 1	9.66

414726	BE466863	Hs.280099	ESTs	9.66
418485	R91679	Hs.124981	ESTs	9.66
433480	X02422	Hs.181125	immunoglobulin lambda locus	9.65
441530	AI248301	Hs.127112	ESTs	9.65
433533	D53304	Hs.65394	ESTs	9.65
421470	R27496	Hs.1378	annexin A3	9.64
438613	C05569	Hs.243122	hypothetical protein FLJ13057 similar to	9.64
429324	AA488101	Hs.199245	inactivation escape 1	9.62
450244	AA007534	Hs.125062	ESTs	9.62
407660	AW063180	Hs.279101	ESTs	9.61
406554				9.60
426404	AA377607	Hs.273138	ESTs	9.58
447045	AW392394	Hs.278569	KIAA0064 gene product	9.58
449894	AK001578	Hs.24129	hypothetical protein FLJ10716	9.58
448376	AI494332	Hs.196963	ESTs	9.58
407902	AL117474	Hs.41181	Homo sapiens mRNA; cDNA DKFZp727C191 (fr	9.56
446572	AV659151	Hs.282961	ESTs	9.56
459245	BE242623	Hs.31939	manic fringe (Drosophila) homolog	9.55
423545	AP000692	Hs.129781	chromosome 21 open reading frame 5	9.54
414697	BE266134	Hs.76927	translocase of outer mitochondrial membr	9.54
410846	AW807057		gb:MR4-ST0062-031199-018-b03 ST0062 Homo	9.52
421181	NM_005574	Hs.184585	LIM domain only 2 (rhombotin-like 1)	9.52
427308	D26067	Hs.174905	KIAA0033 protein	9.52
415995	NM_004573	Hs.994	phospholipase C, beta 2	9.51
434846	AW295389	Hs.119768	ESTs	9.51
414342	AA742181	Hs.75912	Homo sapiens cDNA: FLJ22199 fis, clone H	9.50
416959	D28459	Hs.80612	ubiquitin-conjugating enzyme E2A (RAD6 h	9.50
443123	AA094538	Hs.6588	ESTs	9.50
439312	AA833902	Hs.270745	ESTs	9.48
449375	R07114	Hs.271224	ESTs	9.48
436357	AJ132085		gb:Homo sapiens mRNA for axonemal dynein	9.44
458723	AW137726	Hs.244352	ESTs, Moderately similar to laminin alph	9.44
457526	AW450584	Hs.192131	ESTs, Weakly similar to RIBB [H.sapiens]	9.43
404741				9.43
422409	NM_005428	Hs.116237	vav 1 oncogene	9.43
403708				9.42
408806	AW847814	Hs.289005	Homo sapiens cDNA: FLJ21532 fis, clone C	9.42
417380	T06809		gb:EST04698 Fetal brain, Stratagene (cat	9.42
422501	AA354690	Hs.144967	ESTs	9.42
426197	AA004410	Hs.167835	acyl-Coenzyme A oxidase 1, palmitoyl	9.42
452624	AU076606	Hs.30054	coagulation factor V (proaccelerin, labi	9.42
412110	AW893569		gb:RC0-NN0021-040400-021-c10 NN0021 Homo	9.41
414158	AA361623	Hs.288775	Homo sapiens cDNA FLJ13900 fis, clone TH	9.41
408101	AW968504	Hs.123073	CDC2-related protein kinase 7	9.40
414171	AA360328	Hs.865	RAP1A, member of RAS oncogene family	9.40
415947	U04045	Hs.78934	mutS (E. coli) homolog 2 (colon cancer,	9.40
426959	BE262745		gb:601153869F1 NIH_MGC_19 Homo sapiens c	9.39
417519	AI689987	Hs.177669	ESTs, Weakly similar to RMS1_HUMAN REGUL	9.39
457181	BE514362	Hs.296422	FK506-binding protein 3 (25kD)	9.39
402835				9.38
404632				9.38
446566	H95741	Hs.17914	Homo sapiens cDNA: FLJ22801 fis, clone K	9.37
455369	AW903533		gb:CM1-NN1031-060400-178-d05 NN1031 Homo	9.37
444001	AI095087	Hs.152299	ESTs, Moderately similar to ALU5_HUMAN A	9.36
458191	AI420611	Hs.127832	ESTs	9.36
431374	BE258532	Hs.251871	CTP synthase	9.34
429327	AA283981	Hs.199248	prostaglandin E receptor 4 (subtype EP4)	9.33
407061	X97748		gb:H.sapiens PTX3 gene promotor region.	9.33
416967	BE616731	Hs.80645	interferon regulatory factor 1	9.33
423013	AW875443	Hs.22209	secreted modular calcium-binding protein	9.33
439461	AA693960	Hs.103158	ESTs	9.33
418830	BE513731	Hs.88959	Human DNA sequence from clone 967N21 on	9.32
422763	AA033699	Hs.83938	ESTs, Moderately,similar to MASP-2 [H.sa	9.32
442739	NM_007274	Hs.8679	cytosolic acyl coenzyme A thioester hydr	9.32
452859	AI300555	Hs.288158	Homo sapiens cDNA: FLJ23591 fis, clone L	9.32
403237				9.32
415000	AW025529	Hs.239812	ESTs, Weakly similar to CALM_HUMAN CALMO	9.31
417951	AW976410	Hs.289069	Homo sapiens cDNA: FLJ21016 fis, clone C	9.30
419066	Z98492	Hs.6975	PRO1073 protein	9.30

448443	AW167128	Hs.231934	ESTs	9.30
405125				9.30
409768	AW499566		gb:UI-HF-BR0p-aji-h-03-0-UI.r1 NIH_MGC_5	9.28
453708	AI191811	Hs.54629	ESTs	9.28
442271	AF000652	Hs.8180	syndecan binding protein (syntenin)	9.27
410055	AJ250839	Hs.58241	gene for serine/threonine protein kinase	9.26
448692	AW013907	Hs.224276	ESTs, Moderately similar to predicted us	9.26
417381	AF164142	Hs.82042	solute carrier family 23 (nucleobase tra	9.25
422497	D29642	Hs.1528	KIAA0053 gene product	9.25
414140	AA281279	Hs.23317	ESTs	9.24
435980	AF274571	Hs.129142	ESTs; Weakly similar to DEOXYRIBONUCLEAS	9.24
458530	BE395035	Hs.199889	ESTs, Weakly similar to KIAA0874 protein	9.24
402585				9.24
420819	AA280700		gb:zs95h11.s1 NCI_CGAP_GCB1 Homo sapiens	9.23
444755	AA431791	Hs.183001	ESTs	9.22
411630	U42349	Hs.71119	Putative prostate cancer tumor suppresso	9.22
421248	AW582962	Hs.300961	ESTs, Highly similar to AF151805 1 CGI-4	9.20
421924	BE514514	Hs.109606	coronin, actin-binding protein, 1A	9.19
414888	AL039185	Hs.77558	thyroid hormone receptor interactor 7	9.18
434267	AI206589	Hs.116243	ESTs	9.17
409213	U61412	Hs.51133	PTK6 protein tyrosine kinase 6	9.17
428242	H55709	Hs.2250	leukemia inhibitory factor (cholinergic	9.16
451736	AW080356	Hs.293684	ESTs, Weakly similar to alternatively sp	9.15
413627	BE182082	Hs.246973	ESTs	9.14
416134	AA528402	Hs.74861	activated RNA polymerase II transcriptio	9.14
449251	AW151660	Hs.31444	ESTs	9.14
452813	U54727	Hs.191445	ESTs	9.14
443622	AI911527	Hs.11805	ESTs	9.14
413260	BE075281		gb:PM1-BT0585-290200-005-d07 BT0585 Homo	9.12
413450	Z99716	Hs.75372	N-acetylgalactosaminidase, alpha-	9.12
446442	BE221533	Hs.257858	ESTs	9.12
438540	AA810021	Hs.136906	ESTs	9.12
426251	M24283	Hs.168383	intercellular adhesion molecule 1 (CD54)	9.11
410290	AA402307	Hs.73818	ubiquinol-cytochrome c reductase hinge p	9.10
437398	AA913736	Hs.126715	ESTs	9.10
421559	NM_014720	Hs.105751	Ste20-related serine/threonine kinase	9.10
439699	AF086534	Hs.187561	ESTs, Moderately similar to ALU1_HUMAN A	9.10
430799	C19035	Hs.164259	ESTs	9.09
424544	M88700	Hs.150403	dopa decarboxylase (aromatic L-amino aci	9.08
453942	AW190920	Hs.19928	ESTs	9.08
425844	T68073	Hs.159628	serine (or cysteine) proteinase inhibito	9.08
434658	AI624436	Hs.194488	ESTs	9.07
453999	BE328153	Hs.240087	ESTs	9.06
438490	R71543	Hs.18713	ESTs	9.05
409192	AA065131	Hs.233439	ESTs, Weakly similar to ALU7_HUMAN ALU S	9.05
446223	BE300091	Hs.119699	hypothetical protein FLJ12969	9.04
447247	AW369351	Hs.287955	Homo sapiens cDNA FLJ13090 fis, clone NT	9.04
450094	AI174947	Hs.295789	Homo sapiens mRNA; cDNA DKFZp564D1164 (f	9.04
432012	AW301344	Hs.195969	ESTs	9.04
422520	AU076730	Hs.117977	kinesin 2 (60-70kD)	9.02
418650	BE386750	Hs.86978	prolyl endopeptidase	9.02
423008	M81590	Hs.123016	5-hydroxytryptamine (serotonin) receptor	9.02
438476	AA326108	Hs.53631	ESTs	9.02
448206	BE622585	Hs.3731	ESTs	9.02
431574	AW572659	Hs.261373	adenosine A2b receptor pseudogene	9.01
443453	R99876	Hs.269882	ESTs	9.01
435472	AW972330	Hs.283022	triggering receptor expressed on myeloid	9.01
420337	AW295840	Hs.14555	Homo sapiens cDNA: FLJ21513 fis, clone C	9.00
449810	AB008681	Hs.23994	activin A receptor, type IIB	9.00
406780	AA902386	Hs.286	ribosomal protein L4	8.99
429169	AW341130	Hs.197757	ESTs, Moderately similar to FGFE_HUMAN F	8.99
421326	AF051428	Hs.103504	estrogen receptor 2 (ER beta)	8.97
425491	AA883316	Hs.255221	ESTs	8.96
425516	BE000707	Hs.29567	ESTs	8.96
439773	AI051313	Hs.143315	ESTs	8.96
443247	BE614387	Hs.47378	ESTs	8.96
456623	AI084125	Hs.108106	transcription factor	8.95
438707	L08239	Hs.5326	porcupine	8.95
402240				8.95

444152	AI125694	Hs.149305	Homo sapiens cDNA FLJ14264 fis, clone PL	8.95
409842	AW501758		gb:UI-HF-BR0p-ajm-c-09-0-UI.r1 NIH_MGC_5	8.94
416277	W78765	Hs.73580	ESTs	8.94
456697	AI908006	Hs.111334	ferritin, light polypeptide	8.94
410762	AF226053	Hs.66170	HSKM-B protein	8.92
412942	AL120344	Hs.75074	mitogen-activated protein kinase-activat	8.92
442320	AI287817	Hs.129636	ESTs	8.92
449673	AA002064	Hs.18920	ESTs	8.91
411486	N85785	Hs.181165	eukaryotic translation elongation factor	8.90
437916	BE566249	Hs.20999	Homo sapiens cDNA: FLJ23142 fis, clone L	8.90
442732	AA257161	Hs.8658	hypothetical protein DKFZp434E0321	8.89
419741	NM_007019	Hs.93002	ubiquitin carrier protein E2-C	8.89
411499	AW849292		gb:IL3-CT0215-020300-090-E06 CT0215 Homo	8.89
431154	AW971228	Hs.290259	ESTs	8.89
414922	D00723	Hs.77631	glycine cleavage system protein H (amino	8.88
418038	Z37976	Hs.83337	latent transforming growth factor beta b	8.87
406422				8.87
422926	NM_016102	Hs.121748	ring finger protein 16	8.87
435220	D50030	Hs.104	HGF activator	8.86
418203	X54942	Hs.83758	CDC28 protein kinase 2	8.86
418613	AA744529	Hs.86575	mitogen-activated protein kinase kinase	8.85
439250	H66566	Hs.271711	ESTs	8.85
432359	AA076049	Hs.274415	Homo sapiens cDNA FLJ10229 fis, clone HE	8.84
450000	AI952797	Hs.10888	Homo sapiens cDNA: FLJ21559 fis, clone C	8.83
425657	T89839	Hs.119471	ESTs	8.83
425694	U51333	Hs.159237	hexokinase 3 (white cell)	8.82
419972	AL041465	Hs.294038	ESTs, Moderately similar to ALU2_HUMAN A	8.82
436396	AI683487	Hs.299112	Homo sapiens cDNA FLJ11441 fis, clone HE	8.82
413413	D82520	Hs.301834	Homo sapiens cDNA FLJ10952 fis, clone PL	8.82
428807	AA435997	Hs.104930	ESTs	8.82
415839	R40611	Hs.137565	ESTs	8.81
419553	N34145	Hs.250614	ESTs	8.80
420309	AW043637	Hs.21766	ESTs	8.80
421863	AI952677	Hs.108972	Homo sapiens mRNA; cDNA DKFZp434P228 (fr	8.80
447965	AW292577	Hs.94445	ESTs	8.80
459172	BE063380		gb:PM0-BT0275-291099-002-g10 BT0275 Homo	8.80
403259				8.78
411534	AW850473		gb:IL3-CT0219-280100-061-B11 CT0219 Homo	8.78
456161	BE264645	Hs.282093	Homo sapiens cDNA: FLJ21918 fis, clone H	8.77
413654	AA331881	Hs.75454	peroxiredoxin 3	8.76
401744				8.76
425348	AL137477	Hs.155912	cadherin-like 24	8.76
423396	AI382555	Hs.127950	bromodomain-containing 1	8.75
450649	NM_001429	Hs.297722	Human DNA sequence from clone RP1-85F18	8.75
408331	NM_007240	Hs.44229	dual specificity phosphatase 12	8.74
423872	AB020316	Hs.134015	uronyl 2-sulfotransferase	8.74
424906	AI566086	Hs.153716	Homo sapiens mRNA for Hmob33 protein, 3'	8.74
427596	AA449506	Hs.179765	Homo sapiens mRNA; cDNA DKFZp586H1921 (f	8.73
432488	AA551010	Hs.216640	ESTs	8.72
448980	AL137527	Hs.22703	Homo sapiens mRNA; cDNA DKFZp434P1018 (f	8.72
429455	AI472111	Hs.292507	ESTs	8.71
429855	AW385597	Hs.138902	ESTs, Weakly similar to B34087 hypotheti	8.71
441746	H59955	Hs.127829	ESTs	8.70
411945	AL033527	Hs.92137	v-myc avian myelocytomatosis viral oncog	8.70
413492	D87470	Hs.75400	KIAA0280 protein	8.70
435706	W31254	Hs.7045	GL004 protein	8.70
433741	AA609019	Hs.159343	ESTs	8.70
426340	Z97989	Hs.169370	FYN oncogene related to SRC, FGR, YES	8.69
422779	AA317036	Hs.41989	ESTs	8.67
449785	AI225235	Hs.288300	Homo sapiens cDNA: FLJ23231 fis, clone C	8.67
420144	AA811813	Hs.119421	ESTs	8.66
420235	AA256756	Hs.31178	ESTs	8.66
432606	NM_002104	Hs.3066	granzyme K (serine protease, granzyme 3;	8.66
425762	BE244076	Hs.159578	Homo sapiens mRNA for FLJ00020 protein,	8.65
427448	BE246449	Hs.2157	Wiskott-Aldrich syndrome (eczema-thrombo	8.64
418033	W68180	Hs.259855	Homo sapiens cDNA FLJ12507 fis, clone NT	8.64
429084	AJ001443	Hs.195614	splicing factor 3b, subunit 3, 130kD	8.64
417094	NM_006895	Hs.81182	histamine N-methyltransferase	8.64
457277	NM_004736	Hs.227656	xenotropic and polytropic retrovirus rec	8.63

422631	BE218919	Hs.118793	hypothetical protein FLJ10688	8.63
410879	AW795196	Hs.215857	ring finger protein 14	8.63
431585	BE242803	Hs.262823	hypothetical protein FLJ10326	8.62
401851				8.62
401866				8.62
407783	AW996872	Hs.172028	a disintegrin and metalloproteinase doma	8.62
408242	AA251594	Hs.43913	PIBF1 gene product	8.62
422250	AW408530	Hs.113823	ClpX (caseinolytic protease X, E. coli)	8.62
430259	BE550182	Hs.127826	RalGEF-like protein 3, mouse homolog	8.62
452598	AI831594	Hs.68647	ESTs, Weakly similar to ALU7_HUMAN ALU S	8.62
419541	AW749617		gb:RC3-BT0502-130100-012-g07 BT0502 Homo	8.60
428839	AI767756	Hs.82302	ESTs	8.60
429328	AA829402	Hs.47939	ESTs	8.60
451491	AI972094	Hs.286221	Homo sapiens cDNA FLJ13741 fis, clone PL	8.60
452561	AI692181	Hs.49169	KIAA1634 protein	8.60
420027	AF009746	Hs.94395	ATP-binding cassette, sub-family D (ALD)	8.60
435205	X54136	Hs.181125	immunoglobulin lambda locus	8.60
430900	U91939	Hs.248123	G protein-coupled receptor 25	8.60
405074				8.59
437991	AI479773	Hs.181679	ESTs	8.59
436346	BE328882	Hs.193096	ESTs, Moderately similar to U119_HUMAN U	8.58
411079	AA091228		gb:cchn2152.seq.F Human fetal heart, Lam	8.57
418452	BE379749	Hs.85201	C-type (calcium dependent, carbohydrate-	8.56
429109	AL008637	Hs.196352	neutrophil cytosolic factor 4 (40kD)	8.56
448019	AW947164	Hs.195641	ESTs	8.56
449865	AW204272	Hs.199371	ESTs	8.55
431180	H55883		gb:yq94h03.r1 Soares fetal liver spleen	8.54
445988	BE007663	Hs.13503	inactivation escape 2	8.54
405876				8.54
407235	D20569	Hs.169407	SAC2 (suppressor of actin mutations 2, y	8.54
414807	AI738616	Hs.77348	hydroxyprostaglandin dehydrogenase 15-(N	8.54
425671	AF193612	Hs.159142	lunatic fringe (Drosophila) homolog	8.54
452413	AW082633	Hs.212715	ESTs	8.54
421620	AA446183	Hs.91885	ESTs	8.53
444539	AI955765	Hs.146907	ESTs	8.52
415102	M31899	Hs.77929	excision repair cross-complementing rode	8.51
405552				8.51
418068	AW971155	Hs.293902	ESTs, Weakly similar to prolyl 4-hydroxy	8.50
420133	AA426117	Hs.14373	ESTs	8.50
438887	R68857	Hs.265499	ESTs	8.50
446468	AI765890	Hs.16341	ESTs; Moderately similar to !!!! ALU SUB	8.50
446585	AV659397	Hs.282948	ESTs	8.50
441896	AW891873		gb:CM3-NT0090-040500-173-b02 NT0090 Homo	8.50
437718	AI927288	Hs.196779	ESTs	8.48
420656	AA279098	Hs.187638	ESTs	8.48
429303	AW137635	Hs.44238	ESTs	8.48
450624	AL043983	Hs.125063	Homo sapiens cDNA FLJ13825 fis, clone TH	8.48
452573	AI907957	Hs.287622	Homo sapiens cDNA FLJ14082 fis, clone HE	8.48
456341	AA229126	Hs.122647	N-myristoyltransferase 2	8.48
423024	AA593731	Hs.75613	CD36 antigen (collagen type I receptor,	8.47
446985	AL038704	Hs.156827	ESTs, Weakly similar to ALU1_HUMAN ALU S	8.46
431778	AL080276	Hs.268562	regulator of G-protein signalling 17	8.46
400268				8.46
421828	AW891965	Hs.289109	dimethylarginine dimethylaminohydrolase	8.45
417022	NM_014737	Hs.80905	Ras association (RalGDS/AF-6) domain fam	8.44
421029	AW057782	Hs.293053	ESTs	8.44
425171	AW732240	Hs.300615	ESTs	8.44
459070	AI814302		gb:wj71c12.x1 NCI_CGAP_Lu19 Homo sapiens	8.42
406006				8.42
412643	AW971239	Hs.293982	ESTs	8.42
424775	AB014540	Hs.153026	SWAP-70 protein	8.42
446848	AW136083	Hs.195266	ESTs, Weakly similar to S59501 interfero	8.42
448043	AI458653	Hs.201881	ESTs	8.41
407183	AA358015		gb:EST66864 Fetal lung III Homo sapiens	8.40
412324	AW978439	Hs.69504	ESTs	8.40
419594	AA013051	Hs.91417	topoisomerase (DNA) II binding protein	8.40
430968	AW972830		gb:EST384925 MAGE resequences, MAGL Homo	8.40
431689	AA305688	Hs.267695	UDP-Gal:betaGlcNAc beta 1,3-galactosyltr	8.40
438582	AI521310	Hs.283365	ESTs, Weakly similar to ALU5_HUMAN ALU S	8.40

447685	AL122043	Hs.19221	hypothetical protein DKFZp566G1424	8.40
459119	AW844498	Hs.289052	Homo sapiens LENG8 mRNA, variant C, part	8.38
400817				8.37
425265	BE245297		gb:TCBAP1E2482 Pediatric pre-B cell acut	8.37
409385	AA071267		gb:zm61g01.r1 Stratagene fibroblast (937	8.36
439121	BE047779	Hs.44701	ESTs	8.36
419968	X04430	Hs.93913	interleukin 6 (interferon, beta 2)	8.36
408327	AW182309	Hs.249963	ESTs, Highly similar to dJ1170K4.4 [H.sa	8.35
403976				8.34
448064	AA379036		gb:EST91809 Synovial sarcoma Homo sapien	8.33
442914	AW188551	Hs.99519	Homo sapiens cDNA FLJ14007 fis, clone Y7	8.33
428032	AW997704	Hs.11493	Homo sapiens cDNA FLJ13536 fis, clone PL	8.32
434194	AF119847	Hs.283940	Homo sapiens PRO1550 mRNA, partial cds	8.32
458677	AW937670	Hs.254379	ESTs	8.32
420925	NM_015698	Hs.100391	T54 protein	8.30
416475	T70298		gb:yd26g02.s1 Soares fetal liver spleen	8.30
416852	AF283776	Hs.80285	Homo sapiens mRNA; cDNA DKFZp586C1723 (f	8.30
430676	AF084866		gb:Homo sapiens envelope protein RIC-3 (	8.30
428455	AI732694	Hs.98520	ESTs	8.29
435343	AW194962	Hs.199028	ESTs	8.29
450783	BE266695		gb:601190242F1 NIH_MGC_7 Homo sapiens cD	8.29
404946				8.28
422942	AF054839	Hs.122540	tetraspan 2	8.28
453716	AA037675	Hs.152675	ESTs	8.28
437098	AA744488	Hs.132842	ESTs, Moderately similar to ALU1_HUMAN A	8.28
443907	AU076484	Hs.9963	TYRO protein tyrosine kinase binding pro	8.27
401930	AF106069	Hs.23168	ubiquitin specific protease 15	8.26
446554	AA151730	Hs.301789	ESTs, Weakly similar to similar to C.ele	8.26
426290	AB007918	Hs.169182	KIAA0449 protein	8.25
419904	AA974411	Hs.18672	ESTs	8.25
413886	AW958264	Hs.103832	ESTs, Weakly similar to TRHY_HUMAN TRICH	8.24
424738	AI963740	Hs.46826	ESTs	8.24
427359	AW020782	Hs.79881	Homo sapiens cDNA: FLJ23006 fis, clone L	8.24
424534	D87682	Hs.150275	KIAA0241 protein	8.24
424429	U63830	Hs.146847	TRAF family member-associated NFKB activ	8.24
442604	BE263710	Hs.279904	ESTs	8.22
442992	AI914699	Hs.13297	ESTs	8.22
427210	BE396283	Hs.173987	eukaryotic translation initiation factor	8.22
457229	BE222450	Hs.266390	ESTs	8.21
423730	AA330214		gb:EST33935 Embryo, 12 week II Homo sapi	8.21
411928	AA888624	Hs.19121	adaptor-related protein complex 2, alpha	8.20
416051	AA835868	Hs.25253	Homo sapiens cDNA: FLJ20935 fis, clone A	8.20
417231	R40739	Hs.21326	ESTs	8.20
422049	W25760	Hs.77631	glycine cleavage system protein H (amino	8.20
427528	AU077143	Hs.179565	minichromosome maintenance deficient (S.	8.20
458776	AV654978	Hs.19904	cystathionase (cystathionine gamma-lyase	8.19
417687	AI828596	Hs.250691	ESTs	8.18
423218	NM_015896	Hs.167380	BLu protein	8.18
425397	J04088	Hs.156346	topoisomerase (DNA) II alpha (170kD)	8.18
406964	M21305	Hs.247946	Human alpha satellite and satellite 3 ju	8.18
402401	U42349	Hs.71119	Putative prostate cancer tumor suppresso	8.18
423397	NM_001838	Hs.1652	chemokine (C-C motif) receptor 7	8.18
427857	AL133017	Hs.2210	thyroid hormone receptor interactor 3	8.17
401519				8.17
447188	H65423	Hs.17631	Homo sapiens cDNA FLJ20118 fis, clone CO	8.16
424704	AI263293	Hs.152096	cytochrome P450, subfamily IIJ (arachido	8.16
435854	AJ278120	Hs.4996	DKFZP564D166 protein	8.14
448556	AW885606	Hs.5064	ESTs	8.14
449217	AA278536	Hs.23262	ribonuclease, RNase A family, k6	8.14
453124	AI139058	Hs.23296	ESTs	8.14
442812	AI018406	Hs.131284	ESTs	8.14
421129	BE439899	Hs.89271	ESTs	8.14

TABLE 9A shows the accession numbers for those primekeys lacking a unigeneID in Table 9. For each probeset we have listed the gene cluster number from which the oligonucleotides were designed. Gene clusters were compiled using sequences derived from Genbank ESTs and mRNAs. These sequences were clustered based on sequence similarity using Clustering and Alignment Tools (DoubleTwist, Oakland California). The Genbank accession numbers for sequences comprising each cluster are listed in the "Accession" column.

Pkey: Unique Eos probeset identifier number
CAT number: Gene cluster number
Accession: Genbank accession numbers

Pkey	CAT number	Accession
408057	1035720_-1	AW139565
408069	103655_1	H81795 Z42291 R20973 AA046920
408182	104479_1	AA047854 AA057506 AA053841
408338	1052148_1	AW867079 AW867086 AW182772
408828	108463_1	BE540279 AW410659 AA057857 R77693 BE278674
409126	110159_1	AA063426 AW962323 AW408063 AA063503 AA772927 AW753492 BE175371 AA311147
409292	111586_1	AA071051 AA070584 AA069938 AA102136 AA074430
409314	111841_1	AA070266 AA084967 AA126998
409385	112523_1	AA071267 T65940 T64515 AA071334
409398	1126716_1	AW386461 AW876408 AW386672 AW386599 AW876258 AW386619 AW386289 AW876136 AW876203 AW876213 AW876301 AW876295 AW876349 AW876365 AW876160 AW876369 AW876352 AW876271
409671	114731_1	AA076769 AA076781 AI087968
409768	1154035_1	AW499566 AW502378 AW499522 AW502046 AW502671 AW501917 AW501868 AW501721 AW502813
409841	1156088_1	AW502139 AW502432 AW502235 AW501683 AW502647
409842	1156119_1	AW501756 AW502096 AW502465 AW501715
409853	1156226_1	AW502327 AW502488 AW501829 AW502625 AW502687
410531	1207200_1	AW752953 H88044 BE156092
410688	1216101_1	AW796342 AW796356 BE161430
410846	1223902_1	AW807057 AW807054 AW807189 AW807193 AW807369 AW807429 AW807364 AW807365 AW807078 AW807256 AW807180 AW807331
410896	1226053_1	AW809637 AW809697 AW810554 AW809707 AW809885 AW810000 AW810088 AW809742 AW809816 AW809749 AW809639 AW809722 AW809836 AW809774 AW810023 AW810013 AW809813 AW809660 AW809728 AW809768 AW809951 AW809657 AW809954
411079	123128_1	AA091228 H71860 H71073
411424	1245497_1	AW845985 AW845991 AW845962
411499	1248105_1	AW849292 AW849431 AW849422 AW849428 AW849420 AW849424 AW849427
411507	1248607_1	AW850140 AW850195 AW850192
411534	1248827_1	AW850473 AW850471 AW850431 AW850523
411972	1268491_1	BE074959 AW880160
412110	1277844_1	AW893569 AW893571 AW893588 AW893593
412226	1284289_1	W26786 AW998812 AW902272
412257	1285376_1	AW903830 BE071916
412405	1293012_1	AW948126 AW948139 AW948196 AW948145 AW948162 AW948134 AW948127 AW948124 AW948153 AW948157 AW948125 AW948131 AW948158 AW948164 AW948151
413260	1356003_1	BE075281 BE075219 BE075123 BE075119 BE075046
413471	1371778_1	BE142098 BE142092
413729	1385114_1	BE159999 BE160056 BE160107 BE160139
414182	142409_1	AA136301 AI381776 AA136321
414989	1511339_1	T81668 C19040 C17569
415354	1534763_1	F06495 R24336 R13046
416011	1566439_1	H14487 R50911 Z43216
416475	1596398_1	T70298 H58072 R02750
417380	1672461_1	T06809 N75735
419392	1843934_-1	W28573
419541	185724_1	AW749617 R64714 AA244138 AA244137 BE094019
419544	185760_2	AI909154 AA526337 AA244193 AI909153
420819	196721_1	AA280700 AW975494 AA687385
421245	200620_1	AA285363 AA285333 AA285359 AA285326 AA285350
422673	219874_1	N59027 AA314694 N53937 R08100

422695	219996_1	AA315158 AW961298 N76067 AW802759 AI858495 W04474
422858	222209_1	R35398 BE252178 AA318153
422940	223106_1	BE077458 AA337277 AA319285
423730	231462_1	AA330214 AW962519 T54709
423790	232031_1	BE152393 AA330984 BE073904
424385	238731_1	AA339666 AW952809 AA349119
424606	241409_1	AA343936 AA344060 AW963081
425265	249175_1	BE245297 AA353976 AW505023
426959	273830_-1	BE262745
430676	32168_1	AF084866 AF084870 AF084864 AF084867 AF084869 AF084865 AF084868 AW818206 AW812038 BE144813 BE144812 AW812041 AW812040 AW812067 BE061583 BE061604 T05808 AI352469 AA580921 BE141783 BE141782 BE061601 AW814393 AW885029
430968	326269_1	AW972830 AA527647 AA489820 AA570362
431180	328906_1	H55883 AW971249 AA493900 H55788
432093	341283_1	H28383 AW972670 H28359 AA525808
434596	38937_1	T59538 T59589 T59598 T59542 AF147374
436357	41842_1	AJ132085 Z83805
437159	43393_1	AL050072 AW900148
437495	43765_1	BE177778 BE177779 AL390180 AA359908
439097	46858_1	H66948 AF085954 H66949
439120	46879_1	H56389 AF085977 H56173
440134	48675_1	BE410734 BE560117 BE270054 BE296330 BE267957 AI003007 BE545259
441896	52842_1	AW891873 AW891897 BE564764
445629	645767_1	AI245701 BE272724
447229	71288_1	BE617135 AW504051 AW504283
448064	74761_1	AA379036 AA150589 AI696854 BE621316
450783	84655_1	BE266695 BE265474 N53200 BE267333
451045	85673_1	AA215672 AI696628 AA013335 H86334 AA017006
452549	921802_1	AI907039 AI907081
452560	922216_1	BE077084 AW139963 AW863127 AW806209 AW806204 AW806205 AW806206 AW806211 AW806212 AW806207 AW806208 AW806210 AI907497
452712	928309_1	AW838616 AW838660 BE144343 AI914520 AW888910 BE184854 BE184784
453758	980026_1	U83527 AL120938 U83522
454093	1007366_1	AW860158 AW862385 AW860159 AW862386 AW862341 AW821869 AW821893 AW062660 AW062656
454563	1224342_1	AW807530 AW807540 AW807537 AW846086 BE141634 AW846089 AW807499 AW807533 AW838499
454791	1234759_1	BE071874 BE071882 AW820782 AW821007
454977	1247099_1	AW848032 AW848630 AW848478 AW848623 AW848484 AW848169 AW848830 AW848149 AW848119 AW848893 AW848903 AW848407
455131	1254674_1	AW857913 AW857916 AW857914 AW861627 AW861626 AW861624
455183	1259023_1	AW984111 AW863918 AW863856
455254	1266449_1	AW877015 AW877133 AW876978 AW877071 AW876988 AW877069 AW877063 AW877013
455369	1285173_16	AW903533 AW903516 AW903562 BE085202 BE085215 BE085214 BE085209 BE085172 BE085175 BE085193 BE085211 BE085199
455982	1396849_1	BE176862 BE176876 BE176947 BE176878
456011	1410860_1	BE243628 BE246081 BE247016 BE241984 BE241534 BE246091 BE245679 BE243620 BE245998 BE242329 BE241417 BE241457 BE242522 BE241989 BE241464
456023	1416335_1	R00028 BE247630
457586	360505_1	AW062439 AW751554 AA579463
457595	364225_-1	AA584854
457751	399422_1	AI908238 AA663731
459070	883688_1	AI814302 AI814428
459081	889426_1	W07808 AI822066
459145	918957_1	AI903354 AI903489 AI903488
459172	921149_1	BE063380 BE063346 AI906097
459234	945240_-1	AI940425

TABLE 9B shows the genomic positioning for those primekeys lacking unigene ID's and accession numbers in Table 9. For each predicted exon, we have listed the genomic sequence source used for prediction. Nucleotide locations of each predicted exon are also listed.

Pkey:	Unique number corresponding to an Eos probeset
Ref:	Sequence source. The 7 digit numbers in this column are Genbank Identifier (GI) numbers. "Dunham I. et al." refers to the publication entitled "The DNA sequence of human chromosome 22." Dunham I. et al., Nature (1999) 402:489-495.
Strand:	Indicates DNA strand from which exons were predicted.
Nt_position:	Indicates nucleotide positions of predicted exons.

Pkey	Ref	Strand	Nt_position
400452	8113550	Minus	90308-90505
400557	9801261	Plus	208453-208528,209633-209813
400615	9908994	Plus	118036-118166,118681-118807
400802	8567867	Minus	174571-174856
400817	8569994	Plus	170793-170948
400880	9931121	Plus	29235-29336,36363-36580
400885	9958187	Minus	58242-58733
400926	7651921	Minus	52033-52158,53956-54120,54957-55052,55420-55480,56452-56666,57221-57718
400952	7658481	Plus	192667-192826,194387-194876
400991	8096825	Plus	159197-159320
401044	8117619	Plus	73501-73674
401124	8570286	Minus	124181-124391
401163	6981820	Plus	5302-5545
401201	9743387	Minus	138534-138629,139234-139294,140121-140335,142033-142479
401286	9801342	Minus	147036-147318
401384	6850939	Minus	58360-58545
401468	6433826	Plus	13056-13482
401515	7630851	Plus	29929-30126
401519	6649315	Plus	157315-157950
401672	9838136	Plus	128526-128704,130755-130860
401744	2576349	Plus	14595-14751
401851	7770425	Minus	146443-146664,147794-147971,148351-148480,148980-149111,149801-149949
401866	8018106	Plus	73126-73623
402240	7690131	Plus	104382-104527,106136-106372
402359	9211204	Minus	40403-41961
402585	9908890	Minus	174893-175050,183210-183435
402788	9796102	Plus	98273-101430
402802	3287156	Minus	53242-53432
402812	6010110	Plus	25026-25091,25844-25920
402828	8918414	Plus	69071-69642
402835	9187337	Plus	26961-27101
402838	9369121	Minus	32589-32735,35478-35666
402842	9369121	Minus	76355-76479
402895	9967547	Plus	85537-85671,86379-86469
402964	9581599	Minus	46624-46784
403137	9211494	Minus	92349-92572,92958-93084,93579-93712,93949-94072,94591-94748,95214-95337
403237	7637807	Plus	7271-7527
403259	7770585	Plus	4693-4857
403683	7331517	Plus	217175-217446
403690	7387384	Minus	78627-79583
403708	5705981	Minus	134394-134812
403838	4176355	Plus	19197-19502
403851	7708872	Plus	22733-23007
403976	7657840	Plus	24755-24969
404407	7329316	Minus	48154-48499
404426	7407959	Plus	77842-77954
404632	9796668	Plus	45096-45229
404741	8574139	Plus	143025-143467
404756	7706327	Plus	82849-83627
404946	7382189	Plus	134445-134750
405074	7770440	Plus	44340-44559,44790-45059
405125	8247873	Plus	137113-137814
405172	9966752	Plus	153027-153262

405238	7249076	Minus	151699-151915
405325	6094661	Minus	25818-26380
405411	3451356	Minus	17503-17778,18021-18290
405495	8050952	Minus	72182-72373
405552	1552506	Plus	45199-45647
405601	5815493	Minus	147835-147935,149220-149299
405685	4508129	Minus	37956-38097
405777	7263187	Minus	104773-105051
405856	7653009	Plus	101777-102043
405876	6758747	Plus	39694-40031
405932	7767812	Minus	123525-123713
405934	6758795	Plus	159913-160605
406006	8247801	Minus	42640-42776
406134	9163473	Plus	153291-153452
406189	7289992	Minus	22007-22234
406422	9256411	Plus	163003-163311
406516	7711422	Minus	128375-128449,128560-128784
406538	7711478	Plus	35196-35367,38229-38476,40080-40216,43522-43840
406554	7711566	Plus	106956-107121
406577	7711730	Plus	11377-11509

TABLE 10: shows genes, including expression sequence tags differentially expressed in taxol resistant prostate tumor xenografts as compared to taxol sensitive prostate tumor xenografts. The genes are indicated as either being upregulated or downregulated during the induction of taxol resistance in sequential passages of the grafts.

Pkey:	Unique Eos probeset identifier number
ExAccn:	Exemplar Accession number, Genbank accession number
UnigeneID:	Unigene number
Unigene Title:	Unigene gene title
Eos:	Internal Eos name
F00-F14:	passage number

Pkey	ExAccn	UnigeneID	UnigenTitle	Eos	Resp.	F00	F00	F02	F02	F05	F05	F07	F09	F10	F11	F13	F14
117921	N51002	Hs.47170	Liprin A2	PM28	UP	1	9	8	9	32	20	34	122	105	82	71	111
112971	T17185	Hs.4299	ESTs	CHA1	down	290	281	267	335	270	284	150	157	83	89	49	75
126645	AI167942	Hs.61635	STEAP	PAA5	down	106	111	103	71	34	67	33	14	2	1	1	1
119018	N95796	Hs.179809	ESTs	PAB2	down	765	841	757	909	742	704	478	428	253	175	228	238
110844	N31952	Hs.167531	ESTs	PAV7	down	175	192	147	141	123	129	73	65	55	48	54	84
100654	HG2841-HT2969	Hs.75442	Albumin, A	PM01	down	666	605	504	728	357	445	602	187	117	127	117	113
100655	HG2841-HT2970	Hs.75442	Albumin, A	PM02	down	620	653	486	688	368	386	606	175	101	95	115	97
102076	U09579	Hs.252437	cyclin-dep	PM03	down	101	94	143	190	105	107	88	40	34	31	46	22
102208	U22961	Hs.75442	albumin	PM04	down	495	424	323	518	252	296	467	188	169	143	165	145
103739	AA075779	--	mitochondr	PM05	down	75	190	606	230	378	106	218	88	69	192	69	99
107036	AA599690	Hs.15725	SBBI48	PM06	down	87	124	115	188	132	111	66	71	49	70	38	50
108242	AA062746	--	ESTs	PM07	down	14	20	252	13	22	43	193	10	10	104	21	18
108282	AA065143	--	solute car	PM08	down	27	54	178	73	108	37	53	24	14	53	15	34
108679	AA115963	--	beta-1-glo	PM09	down	680	893	1292	656	869	389	1	74	118	662	359	409
108731	AA126313	Hs.107476	ATP syntha	PM10	down	10	19	185	25	60	1	32	3	7	14	1	1
110675	H89355	Hs.6598	adrenergic	PM11	down	207	334	237	239	231	220	119	145	93	64	56	124
115412	AA283804	Hs.193552	ESTs	PM12	down	146	316	282	271	340	334	115	238	100	196	83	207
115844	AA430124	Hs.234607	MDM2	PM13	down	49	93	94	154	132	91	23	54	23	76	14	41
120588	AA281591	Hs.16193	ESTs	PM14	down	80	157	58	141	159	127	39	83	35	37	16	46
132349	Y00705	Hs.181286	serine pro	PM15	down	146	217	214	150	106	128	177	85	54	63	66	56
132888	AA490775	Hs.5920	N-acetylma	PM16	down	92	150	132	178	126	139	53	94	48	67	41	80
132967	AA032221	Hs.61635	STEAP	PM17	down	224	208	203	215	205	180	132	65	68	50	48	63
133063	AA283085	Hs.64065	ESTs	PM18	down	85	148	161	150	92	108	42	99	42	65	29	126
134374	D62633	Hs.8238	ESTs	PM19	down	230	240	194	212	231	189	89	123	107	95	68	91
135400	M23263	Hs.99915	androgen r	PM20	down	36	167	99	178	132	101	23	71	26	122	14	44

TABLE 11: shows genes, including expression sequence tags that are up-regulated in prostate tumor tissue compared to normal prostate tissue as analyzed using Affymetrix/Eos Hu01 GeneChip array. Shown are the ratios of "average" normal prostate to "average" prostate cancer tissues.

Pkey: Unique Eos probeset identifier number
ExAccn: Exemplar Accession number, Genbank accession number
UnigeneID: Unigene number
Unigene Title: Unigene gene title
R1: Background subtracted normal prostate : prostate tumor tissue

Pkey	ExAccn	UnigeneID	Unigene Title	R1
101336	L49169	Hs.75678	FBJ murine osteosarcoma viral oncogene homolog B	0.012
130642	M63438	Hs.156110	Immunoglobulin kappa variable 1D-8	0.015
133512	X01677	Hs.195188	glyceraldehyde-3-phosphate dehydrogenase	0.017
133436	H44631	Hs.737	Immediate early protein	0.017
129292	X13810	Hs.1101	POU domain; class 2; transcription factor 2	0.019
100610	HG2566-HT4792		Microtubule-Associated Protein Tau, Alt. Splice 3, Exon 8	0.02
133448	M34516	Hs.170116	Immunoglobulin lambda-like polypeptide 3	0.021
125193	W67577	Hs.84298	CD74 antigen (invariant polypeptide of major histocompatibility complex; class II antigen-associated)	0.022
133456	T49257	Hs.183704	ubiquitin C	0.022
134546	AA459310	Hs.8518	Homo sapiens mRNA; cDNA DKFZp586L1722 (from clone DKFZp586L1722)	0.023
102131	U15085	Hs.1162	major histocompatibility complex; class II; DM beta	0.023
101375	M13560	Hs.84298	CD74 antigen (invariant polypeptide of major histocompatibility complex; class II antigen-associated)	0.023
100674	HG3033-HT3194		Spliceosomal Protein Sap 62	0.024
134365	R32377	Hs.82240	syntaxin 3A	0.027
132335	D60387	Hs.189885	ESTs	0.027
110303	H37901	Hs.32706	ESTs	0.028
131678	N59162	Hs.30542	ESTs	0.028
116599	D80046	Hs.250879	ESTs	0.029
133769	M17733	Hs.75968	thymosin; beta 4; X chromosome	0.029
107904	AA026648	Hs.61389	ESTs	0.03
129427	T80746	Hs.111334	ferritin; light polypeptide	0.03
105987	AA406631	Hs.110299	mitogen-activated protein kinase kinase 7	0.03
131466	F03233	Hs.27189	ESTs	0.032
102859	X00274	Hs.76807	Human HLA-DR alpha-chain mRNA	0.032
134626	S82198	Hs.8709	caldecrin (serum calcium decreasing factor; elastase IV)	0.032
134170	M63138	Hs.79572	cathepsin D (lysosomal aspartyl protease)	0.033
131713	X57809	Hs.181125	Immunoglobulin lambda gene cluster	0.034
100748	HG3517-HT3711		Alpha-1-Antitrypsin, 5' End	0.034
118769	N74496		ESTs	0.034
111734	R25375	Hs.126916	ESTs	0.036
109221	AA192755	Hs.85840	ESTs; Weakly similar to stac [H.sapiens]	0.036
133846	AA480073	Hs.76719	U6 snRNA-associated Sm-like protein	0.036
135281	AA401575	Hs.97757	ESTs	0.037
119073	R32894	Hs.45514	v-ets avian erythroblastosis virus E26 oncogene related	0.037
100760	HG3576-HT3779		Major Histocompatibility Complex, Class II Beta W52	0.037
101426	M19483	Hs.25	ATP synthase; H+ transprtng; mitochndrl F1 complex; beta polypept	0.038
129568	AA428025	Hs.114360	transforming growth factor beta-stimulated protein TSC-22	0.038
130900	Z38468	Hs.21036	ESTs; Moderately similar to F25965_3 [H.sapiens]	0.039
133879	M13829	Hs.77183	v-raf murine sarcoma 3611 viral oncogene homolog 1	0.039
100627	HG2702-HT2798		Serine/Threonine Kinase (Gb:Z25424)	0.039
129424	M55593	Hs.111301	matrix metalloproteinase 2 (gelatinase A; 72kD gelatinase; 72kD type IV collagenase)	0.039
128652	AA621245	Hs.103147	ESTs; Weakly similar to similar to SP:YR40_BACSU [C.elegans]	0.039
129979	T72635	Hs.13956	ESTs	0.039
133468	X03068	Hs.73931	major histocompatibility complex; class II; DQ beta 1	0.04
102636	U67092		Human ataxia-telangiectasia locus protein (ATM) gene, exons 1a, 1b, 2, 3 and 4, partial cds	0.04
129536	M33493	Hs.184504	tryptase; alpha	0.04
133599	M64788	Hs.75151	RAP1; GTPase activating protein 1	0.041

102104	U12139		Human alpha1(XI) collagen (COL11A1) gene, 5' region and exon 1	0.041
131340	AA478305	Hs.25817	Homo sapiens chromosome 19; cosmid R27216	0.041
130446	X79510	Hs.155693	protein tyrosine phosphatase; non-receptor type 21	0.042
101352	L77701	Hs.16297	COX17 (yeast) homolog; cytochrome c oxidase assembly protein	0.042
122593	AA453310	Hs.128749	alpha-methylacyl-CoA racemase	0.042
130181	R39552	Hs.151608	Homo sapiens clone 23622 mRNA sequence	0.042
134071	Z14093	Hs.78950	branched chain keto acid dehydrogenase E1; alpha polypeptide (maple syrup urine disease)	0.042
108129	AA053252	Hs.185848	ESTs; Weakly similar to !! ALU SUBFAMILY J WARNING ENTRY !! [H.sapiens]	0.043
130511	L32137	Hs.1584	cartilage oligomeric matrix protein (pseudoachondroplasia; epiphyseal dysplasia 1; multiple)	0.043
133336	AA291456	Hs.71190	ESTs	0.043
132982	L02326	Hs.198118	immunoglobulin lambda-like polypeptide 2	0.044
131880	AA047034	Hs.33818	RecQ protein-like 5	0.044
130540	U35234	Hs.159534	protein tyrosine phosphatase; receptor type; S	0.044
133467	AA258595	Hs.73931	major histocompatibility complex; class II; DQ beta 1	0.044
101191	L20688	Hs.83656	Rho GDP dissociation inhibitor (GDI) beta	0.044
101860	M95610	Hs.37165	collagen; type IX; alpha 2	0.044
102799	U88898		Human endogenous retroviral H protease/integrase-derived ORF1 mRNA, complete cds, and putative envelope prot mRNA, partial cds	0.044
107200	D20350	Hs.5628	ESTs	0.044
101166	L14927	Hs.2099	lipocalin 1 (protein migrating faster than albumin; tear prealbumin)	0.044
134289	M54915	Hs.81170	pim-1 oncogene	0.044
135329	AA436026	Hs.98858	ESTs	0.044
124950	T03786	Hs.151531	protein phosphatase 3 (formerly 2B); catalytic subunit; beta isoform (calcineurin A beta)	0.044
102919	X12447	Hs.183760	aldolase A; fructose-bisphosphate	0.044
100574	HG2279-HT2375		Triosephosphate Isomerase	0.045
131286	AA450092	Hs.25300	Homo sapiens clones 24718 and 24825 mRNA sequence	0.045
102675	U72512		Human B-cell receptor associated protein (hBAP) alternatively spliced mRNA, partial 3'UTR	0.045
131332	R50487	Hs.25717	ESTs	0.045
101634	M57731	Hs.75765	GRO2 oncogene	0.046
113118	T47906	Hs.220512	ESTs	0.046
124884	R77276	Hs.120911	ESTs	0.046
130523	W76097	Hs.214507	ESTs	0.046
110244	H26742	Hs.25367	ESTs; Weakly similar to ALR [H.sapiens]	0.046
131932	AA454980	Hs.25601	chromodomain helicase DNA binding protein 3	0.046
132509	H09751	Hs.5038	neuropathy target esterase	0.046
133372	AA291139	Hs.72242	ESTs	0.046
100817	HG4011-HT4804		Dystrophin-Associated Glycoprotein, 50 Kda, Alt. Splice 2	0.047
106746	AA476438	Hs.7991	ESTs	0.047
135401	L14813	Hs.169271	carboxyl ester lipase-like (bile salt-stimulated lipase-like)	0.047
130479	R44163	Hs.12457	Homo sapiens clone 23770 mRNA sequence	0.047
102589	U62015	Hs.8867	cysteine-rich; angiogenic inducer; 61	0.047
121521	AA412165	Hs.97358	EST	0.048
135340	AA425137	Hs.99093	Homo sapiens chromosome 19; cosmid R28379	0.048
132336	AA342422	Hs.45073	ESTs	0.048
115368	AA282133	Hs.88960	ESTs; Weakly similar to similar to collagen [C.elegans]	0.048
101278	L38487	Hs.110849	estrogen-related receptor alpha	0.048
103284	X80200	Hs.8375	TNF receptor-associated factor 4	0.048
100564	HG2239-HT2324		Potassium Channel Protein (Gb:Z11585)	0.048
133132	Z40883	Hs.65588	ESTs; Weakly similar to dJ393P12.2 [H.sapiens]	0.048
121811	AA424535	Hs.98416	ESTs	0.048
129613	AA279481	Hs.238831	ESTs; Weakly similar to collagen alpha 1(XVIII) chain [M.musculus]	0.049
132468	S79854	Hs.49322	deiodinase; iodothyronine; type III	0.049
120111	W95841	Hs.136031	ESTs	0.049
103668	Z83741	Hs.248174	H2A histone family; member M	0.049
130386	F10874	Hs.234249	mitogen-activated protein kinase 8 interacting protein 1	0.049
104275	C02170	Hs.39387	ESTs; Weakly smlr to weak smlrity to ribosomal prot L14 [C.elegans]	0.049
106305	AA436146	Hs.12828	ESTs	0.05
116431	AA609878	Hs.55289	ESTs; Weakly smlr to 110 KD CELL MEMBRANE GLYCOPROTEIN [H.sapiens]	0.813
120339	AA206465	Hs.256470	EST	0.05
114427	AA017063		ESTs; Highly similar to Miz-1 protein [H.sapiens]	0.05
118821	N79070	Hs.94789	ESTs	0.05
118979	N93798	Hs.43666	protein tyrosine phosphatase type IVA; member 3	0.05
107495	W78776	Hs.90375	ESTs	0.051
120240	Z41732	Hs.66049	ESTs	0.051

114331	Z41309	Hs.12400	ESTs	0.051
130947	R40037	Hs.21506	ESTs	0.052
129242	W81679	Hs.5174	ribosomal protein S17	0.052
131413	AA482390	Hs.26510	ESTs; Modly smlr to vacuolar prot sorting homolog r-vps33b [R.norvegicus]	0.052
112304	R54798	Hs.26239	ESTs	0.052
101416	M17254	Hs.45514	v-ets avian erythroblastosis virus E26 oncogene related	0.052
131201	AA426304	Hs.24174	ESTs	0.052
101054	K02405	Hs.73933	Human MHC class II HLA-DQ-beta mRNA (DR7 DQw2); complete cds	0.052
101306	L41143	Hs.232069	T-cell leukemia translocation altered gene	0.053
129311	T55087		yb45c08.r1 Stratagene fetal spleen (#937205) Homo sapiens cDNA clone IMAGE:74126 5', mRNA sequence.	0.053
129942	U95301	Hs.144442	phospholipase A2; group X	0.053
119210	R93340	Hs.92995	ESTs	0.053
101046	K01160		Accession not listed in Genbank	0.053
114086	Z38266	Hs.12770	Homo sapiens PAC clone DJ0777O23 from 7p14-p15	0.053
110171	H19964	Hs.31709	ESTs	0.053
101004	J04101	Hs.248109	v-ets avian erythroblastosis virus E26 oncogene homolog 1	0.053
129715	N58479	Hs.12126	ESTs; Weakly similar to LR8 [H.sapiens]	0.053
101581	M34996	Hs.198253	major histocompatibility complex; class II; DQ alpha 1	0.053
113285	T66830	Hs.182712	ESTs	0.053
127537	AA569531	Hs.162859	ESTs	0.054
100813	HG3995-HT4265		Cpg-Enriched Dna, Clone S19	0.054
101841	M93107	Hs.76893	3-hydroxybutyrate dehydrogenase (heart; mitochondrial)	0.054
135053	R77159	Hs.93678	ESTs	0.054
101419	M17886	Hs.177592	ribosomal protein; large; P1	0.054
119724	W69468	Hs.47622	ESTs	0.055
102673	U72509		Human alternatively spliced B8 (B7) mRNA, partial sequence	0.055
129877	AA248589	Hs.13094	ESTs; Weakly similar to ORF YGR101w [S.cerevisiae]	0.055
114788	AA156737	Hs.103904	EST	0.055
123812	AA620807	Hs.111591	ESTs	0.055
117669	N39237	Hs.44977	ESTs	0.055
123782	AA610111	Hs.162695	EST	0.055
102395	U41767	Hs.92208	a disintegrin and metalloproteinase domain 15 (metargidin)	0.055
133795	M12529	Hs.169401	apolipoprotein E	0.055
123193	AA489228	Hs.136956	ESTs	0.056
132595	AA253369	Hs.155742	glyoxylate reductase/hydroxypyruvate reductase	0.056
104161	AA456471	Hs.7724	KIAA0963 protein	0.056
115330	AA281145	Hs.88827	ESTs	0.056
112893	T08000	Hs.194684	bassoon (presynaptic cytomatrix protein)	0.056
133475	L29217	Hs.73987	CDC-like kinase 3	0.056
128699	K03207	Hs.103972	proline-rich protein BstNI subfamily 4	0.056
102940	X13956	Hs.24998	Hu 12S RNA induced by poly(rI); poly(rC) and Newcastle disease virus	0.056
131299	AA431464	Hs.25426	ESTs; Weakly similar to unknown [H.sapiens]	0.057
102495	U51240	Hs.79356	Lysosomal-associated multispanning membrane protein-5	0.057
129594	R70379	Hs.115396	Human germline IgD chain gene; C-region; C-delta-1 domain	0.057
118593	N69020	Hs.207689	EST	0.057
126702	U54602	Hs.2785	keratin 17	0.057
124386	N27368	Hs.212414	sema domain; immunoglobulin domain (Ig); short basic domain; secreted; (semaphorin) 3E	0.057
130538	M20786	Hs.159509	alpha-2-plasmin inhibitor	0.057
114299	Z40782	Hs.22920	similar to S68401 (cattle) glucose induced gene	0.057
115604	AA400378	Hs.49391	ESTs	0.057
106052	AA416947	Hs.6382	ESTs; Highly similar to KIAA0612 protein [H.sapiens]	0.057
131730	U05681	Hs.31210	B-cell CLL/lymphoma 3	0.057
131285	AA479498	Hs.25274	ESTs; Modly smlr to putative seven pass transmembrane prot [H.sapiens]	0.058
129705	X78706	Hs.12068	carnitine acetyltransferase	0.058
123175	AA489010	Hs.178400	ESTs	0.058
103592	Z30644	Hs.123059	chloride channel Kb	0.058
118196	N59478	Hs.48396	ESTs; Moderately similar to tumor necrosis factor-alpha -induced protein B12 [H.sapiens]	0.058
104886	AA053348	Hs.144626	growth differentiation factor 11	0.058
104250	AF000575	Hs.105928	leukocyte immunoglobulin-like receptor; subfamily B (with TM and ITIM domains); member 3	0.058
113301	T67452	Hs.13104	EST	0.058
110441	H50302	Hs.19845	ESTs; Highly smlr to prot phosphatase 2A BR gamma subunit [H.sapiens]	0.058
125297	Z39215	Hs.159409	ESTs	0.058
135258	AA292423	Hs.97272	ESTs; Weakly similar to dJ281H8.2 [H.sapiens]	0.058
130633	T92363	Hs.178703	ESTs	0.058
112006	R42607	Hs.22241	hypothetical protein	0.058

130805	U12194	Hs.170238	sodium channel; voltage-gated; type I; beta polypeptide	0.058
134907	D80002	Hs.178292	KIAA0180 protein	0.058
132619	AA404565	Hs.53447	ESTs; Moderately similar to kinesin light chain 1 [M.musculus]	0.058
135115	N35489	Hs.94853	neurochondrin	0.058
100531	HG1872-HT1907		Major Histocompatibility Complex, Dg	0.058
124530	N62256	Hs.102727	EST	0.058
119960	W87533	Hs.32699	ESTs; Moderately similar to LIV-1 protein [H.sapiens]	0.058
132793	AA478999	Hs.56966	KIAA0906 protein	0.058
101076	L04270	Hs.1116	lymphotoxin beta receptor (TNFR superfamily; member 3	0.058
130655	N92934	Hs.17409	cysteine-rich protein 1 (intestinal)	0.058
134458	AA192614	Hs.83577	cysteine and glycine-rich protein 3 (cardiac LIM protein)	0.058
105904	AA401452	Hs.32060	ESTs	0.059
132878	AA026793	Hs.58679	ESTs; Weakly similar to 4F2/CD98 light chain [M.musculus]	0.059
121828	AA425166	Hs.98497	ESTs	0.059
133418	U76366	Hs.172727	Treacher Collins-Franceschetti syndrome 1	0.059
129317	N46244	Hs.110373	ESTs	0.059
130153	D85815	Hs.15114	ras homolog gene family; member D	0.059
124403	N31745	Hs.102493	ESTs	0.059
127683	AA668123	Hs.134170	ESTs	0.059
129814	W20070	Hs.168625	KIAA0979 protein	0.059
131770	D59682	Hs.31833	ESTs	0.06
117557	N33920	Hs.44532	diubiquitin	0.06
103522	Y10514		H.sapiens mRNA for CD152 protein	0.06
120029	W91960	Hs.250640	sequence-specific single-stranded-DNA-binding protein	0.06
102135	U15460	Hs.41691	activating transcription factor B	0.06
123617	AA609183	Hs.181131	ESTs	0.06
112136	R46100	Hs.9739	ESTs	0.061
133725	V00563	Hs.179543	immunoglobulin mu	0.061
102069	U09196	Hs.82520	Hu 1.1 kb mRNA upregltd in retinoic acid treated HL-60 neutrophilic cells	0.061
106555	AA455000	Hs.16725	ESTs	0.061
123269	AA491226	Hs.105280	ESTs; Weakly similar to dJ963K23.2 [H.sapiens]	0.061
109088	AA166837	Hs.72620	DKFZP434I114 protein	0.061
129399	AA263028	Hs.111076	malate dehydrogenase 2; NAD (mitochondrial)	0.061
129375	W79850	Hs.11081	ESTs; Weakly similar to HPBRII-7 protein [H.sapiens]	0.061
135271	AA397763	Hs.97562	ESTs	0.061
132958	W90398	Hs.6147	KIAA1075 protein	0.061
129384	AA477106	Hs.110757	DNA segment on chromosome 21 (unique) 2056 expressed sequence	0.061
123427	AA598548	Hs.112471	ESTs	0.061
105236	AA219179	Hs.19105	translocase of inner mitochondrial membrane 17 (yeast) homolog B	0.061
101012	J04444	Hs.697	cytochrome c-1	0.062
134791	L18983	Hs.89655	protein tyrosine phosphatase; receptor type; N	0.062
133700	K01396	Hs.75621	protease inhibitor 1 (anti-elastase); alpha-1-antitrypsin	0.062
123887	AA621065	Hs.112943	ESTs	0.062
129363	H05704	Hs.110746	H sapiens HCR (a-helix coiled-coil rod homologue) mRNA; complete cds	0.062
105719	AA291644	Hs.36793	ESTs	0.062
124226	H62396	Hs.190266	ESTs	0.062
117437	N27645		yw5e3.s1 Weizmann Olfactory Epithelium H sapiens cDNA clone IMAGE:255676 3' smlr to contains L1.t3 L1 repetitive element ;, mRNA seq	0.062
132741	AA394133	Hs.55898	ESTs; Highly similar to OASIS protein [M.musculus]	0.062
134437	M26041	Hs.198253	major histocompatibility complex; class II; DQ alpha 1	0.062
107664	AA010594	Hs.5326	ESTs; Moderately similar to pim-1 protein [H.sapiens]	0.062
120844	AA349417	Hs.96917	ESTs	0.062
101574	M34182	Hs.158029	protein kinase; cAMP-dependent; catalytic; gamma	0.062
131219	C00476	Hs.24395	small inducible cytokine subfamily B (Cys-X-Cys); member 14 (BRAK)	0.062
103495	Y09022	Hs.153591	Not56 (D. melanogaster)-like protein	0.062
129607	AA404594	Hs.11607	ESTs	0.062
106467	AA450040	Hs.154162	ADP-ribosylation factor-like 2	0.062
128841	T16358	Hs.106443	ESTs	0.062
100515	HG1723-HT1729		Macrophage Scavenger Receptor, Alt. Splice 2	0.062
119332	T54095		ESTs; Weakly similar to !! ALU SUBFAMILY J WARNING ENTRY !! [H.sapiens]	0.062
134516	AA171939	Hs.23413	ESTs	0.062
135012	X73608	Hs.93029	sparc/osteonectin; cwcv and kazal-like domains proteoglycan (testican)	0.063
103575	Z26256		H.sapiens isoform 1 gene for L-type calcium channel, exon 1	0.063
115514	AA297739	Hs.55609	ESTs; Weakly similar to ISOLEUCYL-TRNA SYNTHETASE; CYTOPLASMIC [H.sapiens]	0.063
103996	AA321355		EST2393 Bone marrow Homo sapiens cDNA 5' end, mRNA sequence	0.063
110505	H55992	Hs.20495	DKFZP434F011 protein	0.063
133912	X62744	Hs.77522	major histocompatibility complex; class II; DM alpha	0.063
129581	M33600	Hs.180255	major histocompatibility complex; class II; DR beta 1	0.063

130139	R38280	Hs.150922	BCS1 (yeast homolog)-like	0.064
105817	AA397825	Hs.5307	synaptopodin	0.064
134658	AA410617	Hs.178009	ESTs	0.064
100306	D50495	Hs.80598	transcription elongation factor A (SII); 2	0.064
100277	D42053	Hs.75890	site-1 protease (subtilisin-like; sterol-regulated; cleaves sterol regulatory element binding proteins)	0.064
133116	D61259	Hs.6529	ESTs	0.064
134909	AA521488	Hs.90998	KIAA0128 protein	0.064
130319	X74794	Hs.154443	minichromosome maintenance deficient (S. cerevisiae) 4	0.064
132057	AA102489	Hs.173484	ESTs	0.064
108334	AA070473		zm7c8.s1 Stratagene neuroepithelium (#937231) Homo sapiens cDNA clone IMAGE:5399 3', mRNA sequence	0.064
129763	F10815	Hs.12373	KIAA0422 protein	0.064
135112	T67464	Hs.94617	ESTs; Weakly similar to predicted using Genefinder [C.elegans]	0.064
122269	AA436856	Hs.98910	ESTs	0.064
133082	AA457129	Hs.6455	RuvB (E coli homolog)-like 2	0.064
113213	T58607		ya94a02.s1 Stratagene placenta (#937225) Homo sapiens cDNA clone IMAGE:69290 3', mRNA sequence.	0.065
106228	AA429290	Hs.17719	ESTs	0.065
130192	Y12661	Hs.171014	VGF nerve growth factor inducible	0.065
104894	AA054087	Hs.18858	phospholipase A2; group IVC (cytosolic; calcium-independent)	0.065
103508	Y10141		H.sapiens DAT1 gene, partial, VNTR	0.065
128474	U40671	Hs.100299	ligase III; DNA; ATP-dependent	0.065
134012	AA417821	Hs.237924	ESTs; Highly similar to CGI-69 protein [H.sapiens]	0.065
134536	AA457735	Hs.850	IMP (inosine monophosphate) dehydrogenase 1	0.065
111714	R23146	Hs.23466	ESTs	0.065
110521	H57060	Hs.108268	ESTs	0.065
103282	X80198	Hs.77628	steroidogenic acute regulatory protein related	0.065
113921	W80730	Hs.28355	ESTs	0.065
129331	N93465	Hs.110453	ESTs; Highly similar to CGI-38 protein [H.sapiens]	0.065
111316	N74597	Hs.180535	ESTs; Weakly similar to mitogen inducible gene mig-2 [H.sapiens]	0.065
135138	AA036794	Hs.95196	ESTs; Weakly similar to T20B12.3 [C.elegans]	0.065
107289	T10792	Hs.172098	ESTs	0.065
121405	AA406083	Hs.98007	ESTs	0.065
124965	T16275	Hs.106359	ESTs	0.065
106595	AA456933	Hs.174481	ESTs	0.066
100106	AF015910		Homo sapiens unknown protein mRNA, partial cds	0.066
134715	AA282757	Hs.89040	prepronociceptin	0.066
135367	AA480109	Hs.9963	TYRO protein tyrosine kinase binding protein	0.066
111533	R08548	Hs.251651	EST	0.066
128509	R53109	Hs.247362	dimethylarginine dimethylaminohydrolase 2	0.066
101030	J05037	Hs.76751	serine dehydratase	0.066
102753	U80226		Human gamma-aminobutyric acid transaminase mRNA, partial cds	0.067
126991	R31652	Hs.821	biglycan	0.067
109583	F02322	Hs.26135	ESTs	0.067
119241	T12559	Hs.221382	ESTs	0.067
130569	AA156597	Hs.256441	EST; Moderately similar to CGI-136 protein [H.sapiens]	0.067
112926	T10316	Hs.4302	ESTs	0.067
120495	AA256073	Hs.190626	ESTs	0.067
130931	AA278412	Hs.21346	ESTs; Weakly similar to F42C5.7 gene product [C.elegans]	0.067
129982	M87789	Hs.140	immunoglobulin gamma 3 (Gm marker)	0.067
133832	H03387	Hs.241305	estrogen-responsive B box protein	0.067
110697	H93721	Hs.20798	ESTs	0.067
121183	AA400138	Hs.97703	ESTs	0.067
130953	U12707	Hs.2157	Wiskott-Aldrich syndrome (eczema-thrombocytopenia)	0.067
102218	U24183	Hs.75160	phosphofructokinase; muscle	0.067
114181	Z39079	Hs.8021	KIAA1058 protein	0.067
116581	D51287	Hs.82148	ribosomal protein S12	0.067
132498	T87708	Hs.50098	ESTs	0.068
103788	AA096014	Hs.9527	ESTs; Highly similar to HSPC013 [H.sapiens]	0.068
102459	U48936		Human amiloride-sensitive epithelial sodium channel gamma subunit mRNA, 5' end, partial cds	0.068
100373	D79999	Hs.77225	ADP-ribosyltransferase (NAD+; poly (ADP-ribose) polymerase)-like 1	0.068
132717	AA203321	Hs.151696	DKFZP727G051 protein	0.068
128863	D87462	Hs.106674	BRCA1 associated protein-1 (ubiquitin carboxy-terminal hydrolase)	0.068
115193	AA262029	Hs.88218	ESTs	0.068
124558	N66046	Hs.141605	ESTs	0.069
117225	N20392	Hs.42846	ESTs	0.069
110665	H83380	Hs.32757	ESTs	0.069

132805	U70663	Hs.182965	Kruppel-like factor 4 (gut)	0.069
105778	AA348910	Hs.153299	DOM-3 (C. elegans) homolog Z	0.069
134770	R72079	Hs.89575	CD79B antigen (immunoglobulin-associated beta)	0.069
123097	AA485869	Hs.105671	ESTs	0.069
100750	HG3523-HT4899		Proto-Oncogene C-Myc, Alt. Splice 3, Orf 114	0.069
125091	T91518		ye20f05.s1 Stratagene lung (#937210) H sapiens cDNA clone IMAGE: 3' similar to contains Alu repetitive element;contains MER12 repetitive element; mRNA sequence.	0.069
100756	HG3565-HT3768		Zinc Finger Protein (Gb:M88357)	0.069
113483	T87768	Hs.16439	ESTs	0.069
101119	L09708	Hs.2253	complement component 2	0.069
102286	U31628	Hs.12503	interleukin 15 receptor; alpha	0.07
135349	D83174	Hs.9930	collagen-binding protein 2 (colligen 2)	0.07
100991	J03764	Hs.82085	plasminogen activator inhibitor; type I	0.07
133675	AA443720	Hs.7551	ESTs; Weakly similar to T25G3.1 [C.elegans]	0.07
105422	AA251014	Hs.12210	ESTs	0.07
102932	X13334	Hs.75627	CD14 antigen	0.07
119147	R58878	Hs.65739	ESTs	0.07
104900	AA055048	Hs.180481	ESTs; Weakly similar to ACROSIN PRECURSOR [H.sapiens]	0.07
133185	AA481404	Hs.6686	ESTs	0.07
115496	AA290674	Hs.71819	eukaryotic translation initiation factor 4E binding protein 1	0.07
121005	AA398332	Hs.97613	ESTs	0.07
124869	R69088	Hs.28728	ESTs; Weakly similar to F55A12.9 [C.elegans]	0.071
129154	N23673	Hs.108969	mannosidase; alpha; class 2B; member 1	0.071
112161	R48295		ESTs; Wkly smlr to !! ALU SUBFAMILY J WARNING ENTRY !! [H.sapiens]	0.071
125251	W87486	Hs.141464	ESTs	0.071
134298	J00116	Hs.81343	collagen; type II; alpha 1 (primary osteoarthritis; spondyloepiphyseal dysplasia; congenital)	0.071
119745	W70264	Hs.58093	ESTs	0.071
131306	AA232686	Hs.25489	ESTs	0.071
107776	AA018820	Hs.221147	ESTs	0.071
134271	AA199630	Hs.184456	ESTs; Wkly smlr to !! ALU SUBFAMILY SX WARNING ENTRY !! [H.sapiens]	0.071
101798	M85220		Accession not listed in Genbank	0.071
135402	S76942	Hs.99922	dopamine receptor D4	0.071
118742	N74052	Hs.50424	EST	0.071
131867	N64656	Hs.3353	Homo sapiens clone 24940 mRNA sequence	0.071
102923	X12517	Hs.1063	small nuclear ribonucleoprotein polypeptide C	0.072
100775	HG371-HT26388		Mucin 1, Epithelial, Alt. Splice 9	0.072
111020	N54361	Hs.165726	ESTs	0.072
134224	X80822	Hs.163593	ribosomal protein L18a	0.072
124059	F13673	Hs.99769	ESTs	0.072
133972	AA160743	Hs.78019	Homo sapiens clone 24432 mRNA sequence	0.072
129681	AA436009	Hs.178186	ESTs; Weakly similar to WASP-family protein [H.sapiens]	0.072
103065	X58399	Hs.81221	Human L2-9 transcript of unrearranged immunoglobulin V(H)5 pseudogene	0.072
124966	T18271	Hs.155560	calnexin	0.072
112270	R53021	Hs.203358	ESTs	0.072
116704	F10183	Hs.66140	EST	0.072
129890	M13699	Hs.111461	ceruloplasmin (ferroxidase)	0.072
127345	AA972008	Hs.166253	ESTs; Highly similar to KIAA0476 protein [H.sapiens]	0.072
112436	R63090	Hs.28391	ESTs	0.072
114531	AA053033	Hs.203330	ESTs	0.072
135122	H99080	Hs.94814	ESTs	0.072
103934	AA281338	Hs.134200	Homo sapiens mRNA; cDNA DKFZp564C186 (from clone DKFZp564C186)	0.072
109363	AA215369	Hs.185764	ESTs; Weakly similar to hypothetical protein [H.sapiens]	0.072
112647	R83329	Hs.33403	ESTs	0.073
127083	Z44079	Hs.91608	otoferlin	0.073
133027	AA402624	Hs.63236	synuclein; gamma (breast cancer-specific protein 1)	0.073
122086	AA432121	Hs.250986	EST	0.073
110405	H47542	Hs.33962	ESTs	0.073
128697	AB002344	Hs.103915	KIAA0346 protein	0.073
112221	R50380	Hs.25670	ESTs	0.073
100478	HG1067-HT1067		Mucin (Gb:M22406)	0.073
115598	AA400129	Hs.65735	ESTs	0.073
132491	AA227137	Hs.4984	KIAA0828 protein	0.073
101655	M60299		Human alpha-1 collagen type II gene, exons 1, 2 and 3	0.073
106018	AA411887	Hs.34737	ESTs	0.073
129683	W05348	Hs.158196	DKFZP434B103 protein	0.073
134137	F10045	Hs.79347	KIAA0211 gene product	0.073
114008	W89128	Hs.19872	ESTs	0.073

107653	AA010210	Hs.47041	ESTs	0.073
104798	AA029462	Hs.17235	ESTs	0.073
134082	L16991	Hs.79006	deoxythymidylate kinase	0.073
119180	R80413	Hs.92520	ESTs	0.073
107741	AA016982	Hs.64341	ESTs	0.073
133683	AA335223	Hs.75558	pepsinogen 5; group I (pepsinogen A)	0.073
111694	R22035	Hs.23331	ESTs	0.073
120764	AA338729	Hs.133096	ESTs	0.073
119389	T88826	Hs.90973	ESTs	0.074
100929	HG688-HT688		Major Histocompatibility Complex, Class II, Dr Beta 2 (Gb:X65561)	0.074
119388	T88798		plasminogen activator inhibitor; type I	0.074
133019	AF009674	Hs.184434	axin	0.074
105185	AA191495	Hs.189937	ESTs	0.074
133413	S72043	Hs.73133	metallothionein 3 (growth inhibitory factor (neurotrophic))	0.074
101017	J04599	Hs.821	biglycan	0.074
132865	K02765	Hs.251972	complement component 3	0.074
110882	N36001	Hs.17348	ESTs; Wkly smlr to !! ALU SUBFAMILY SQ WARNING ENTRY !! [H.sapiens]	0.074
129197	T90303	Hs.109308	ESTs; Wkly smlr to leucine-rich glioma-inactivated prot precursor [H.sapiens]	0.074
101184	L19871	Hs.460	activating transcription factor 3	0.075
134910	AA431320	Hs.9100	ESTs	0.075
119411	T96621	Hs.203656	EST	0.075
102000	U01824	Hs.380	solute carrier family 1 (glial high affinity glutamate transporter); member 2	0.075
114691	AA121893	Hs.103779	ESTs; Weakly similar to envelope protein [H.sapiens]	0.075
134179	U53204	Hs.79706	plectin 1; intermediate filament binding protein; 500kD	0.075
134503	U34880	Hs.84183	diptheria toxin resistance protein required for diphthamide biosynthesis (Saccharomyces)-like 1	0.075
129719	N66396	Hs.167766	ESTs; Moderately similar to Pro-a2(XI) [H.sapiens]	0.075
113918	W80464	Hs.31928	ESTs; Wkly smlr to alternatively spliced product using exon 13A [H.sapiens]	0.075
113897	W73926	Hs.4947	ESTs	0.075
129697	R00841	Hs.172069	DKFZP434C212 protein	0.075
112078	R44155	Hs.112218	ESTs	0.075
121980	AA429886	Hs.110407	ESTs; Weakly similar to coded for by C. elegans cDNA yk173c12.5 [C.elegans]	0.075
100898	HG4638-HT5050		Spliceosomal Protein Sap 49	0.075
121626	AA416974	Hs.98174	ESTs	0.075
133670	AA243416	Hs.75470	hypothetical protein; expressed in osteoblast	0.075
131879	AA017161	Hs.33792	ESTs	0.075
100254	D38037	Hs.77643	FK506-binding protein 1B (12.6 kD)	0.075
133194	AA291726	Hs.67201	ESTs	0.075
106081	AA418394	Hs.25354	ESTs	0.075
115544	AA351433	Hs.66187	Homo sapiens clone 23700 mRNA sequence	0.076
119955	W87460	Hs.58989	ESTs	0.076
104407	H61361	Hs.102171	immunoglobulin superfamily containing leucine-rich repeat	0.076
135019	X58431	Hs.98428	Human Hox2.2 gene for a homeobox protein	0.076
114815	AA161488	Hs.103931	DKFZP434B0335 protein	0.076
119471	W31352	Hs.55445	ESTs	0.076
117788	N48292	Hs.46849	ESTs	0.076
119406	T95064	Hs.193771	EST	0.076
130777	R61742	Hs.256554	ESTs	0.076
130494	L13197	Hs.75874	pregnancy-associated plasma protein A	0.076
104107	AA424111	Hs.12598	T-cell lymphoma invasion and metastasis 2	0.076
121483	AA411981	Hs.25274	ESTs; Modly smlr to putative seven pass transmembrane prot [H.sapiens]	0.076
104451	M13299	Hs.102119	blue cone pigment	0.076
118027	N52770	Hs.75968	thymosin; beta 4; X chromosome	0.076
109419	AA227560	Hs.86987	receptor-interacting serine-threonine kinase 3	0.076
115783	AA424487	Hs.72289	ESTs; Weakly similar to LIV-1 protein [H.sapiens]	0.076
110585	H62223	Hs.133526	ESTs; Wkly smlr to !!!ALU SUBFAMILY SB1 WARNING ENTRY !!![H.sapiens]	0.076
123165	AA488863	Hs.105216	ESTs; Weakly smlr to !!ALU SUBFAMILY J WARNING ENTRY !! [H.sapiens]	0.077
103966	AA303166	Hs.127270	ESTs	0.077
109549	F01528	Hs.21192	Homo sapiens clone 25155 mRNA sequence	0.077
106730	AA465520	Hs.22313	ESTs	0.077
120310	AA193676	Hs.118926	DKFZP586K0919 protein	0.077
104078	AA402801	Hs.222010	ESTs	0.077
117624	N35978	Hs.82364	ESTs	0.077
112421	R62441	Hs.23127	ESTs	0.077
106958	AA497026	Hs.22059	ESTs	0.077
129984	W92811	Hs.183927	ESTs; Weakly similar to !! ALU SUBFAMILY J WARNING ENTRY !! [H.sapiens]	0.077
122044	AA431456	Hs.98736	EST	0.077
123280	AA491285	Hs.175144	ESTs	0.077
115710	AA412535	Hs.55235	sphingomyelin phosphodiesterase 2; neutra	

			l membrane (neutral sphingomyelinase)	0.077
134129	D87444	Hs.79305	KIAA0255 gene product	0.077
129321	AA224502	Hs.206501	Homo sapiens clone 643 unknown mRNA; complete sequence	0.078
130513	AA460257	Hs.15866	ESTs	0.078
100996	J03909	Hs.14623	interferon; gamma-inducible protein 30	0.078
128358	AI095718	Hs.135015	ESTs	0.078
128544	R59352	Hs.119273	KIAA0296 gene product	0.078
106040	AA412681	Hs.125139	ESTs	0.078
106495	AA452113	Hs.32454	ESTs; Moderately similar to KIAA0544 protein [H.sapiens]	0.078
131833	R40899	Hs.32973	glycine receptor; beta	0.078
119219	R97176	Hs.110783	ESTs	0.078
135415	X60655	Hs.99967	even-skipped homeo box 1 (homolog of Drosophila)	0.078
109457	AA232646	Hs.68061	ESTs; Weakly similar to sphingosine kinase [M.musculus]	0.078
117137	H96670	Hs.42221	ESTs	0.078
107094	AA609614	Hs.5241	ESTs	0.078
130165	T90529	Hs.251613	EST	0.078
124072	H05252	Hs.101637	EST; Weakly similar to hypothetical protein [H.sapiens]	0.078
126151	AA324743	Hs.40808	ESTs	0.078
119035	R01779	Hs.7740	ESTs	0.078
110157	H18987	Hs.169731	ESTs	0.078
128515	AA149044	Hs.10086	ESTs; Highly similar to HYPOTHETICAL PROTEIN KIAA0195 [H.sapiens]	0.078
133069	U94836	Hs.6430	protein with polyglutamine repeat	0.078
112209	R49644	Hs.24865	ESTs	0.078
133361	R28279	Hs.71848	Human clone 23548 mRNA sequence	0.078
134714	U89922	Hs.890	lymphotoxin beta (TNF superfamily; member 3)	0.078
129905	T86796	Hs.132875	ESTs; Weakly similar to predicted using Genefinder [C.elegans]	0.079
120421	AA236166	Hs.132957	ESTs; Weakly similar to chondromodulin-I precursor [H.sapiens]	0.079
100885	HG4490-HT4876		Proline-Rich Protein Prb4, Allele	0.079
102789	U86759	Hs.158336	netrin 2 (chicken)-like	0.079
120139	Z39273	Hs.77876	Human DNA from chromosome 19-specific cosmid R30923; genomic sequence	0.079
135238	U76343	Hs.96970	Human liver GABA transport protein mRNA; 3' end	0.079
129618	N54845	Hs.173030	ESTs	0.079
132960	AA609742	Hs.6150	KIAA0521 protein	0.079
108751	AA127063	Hs.203717	ESTs	0.079
134060	D42039	Hs.78871	KIAA0081 protein	0.079
111338	N79778	Hs.35094	extracellular matrix protein 2; female organ and adipocyte specific	0.079
112345	R56880	Hs.26563	ESTs	0.079
126456	W00881		za56d02.r1 Soares fetal liver spleen 1NFLS Homo sapiens cDNA clone IMAGE:296547 5', mRNA sequence.	0.079
128937	Z39939	Hs.10726	ESTs	0.079
103485	Y08409	Hs.248415	thyroid hormone responsive SPOT14 (rat) homolog	0.079
111202	N68280	Hs.107922	ESTs	0.079
132625	AA429890	Hs.166066	cisplatin resistance associated	0.079
103434	X98085	Hs.54433	tenascin R (restrictin; janusin)	0.079
102616	U65581	Hs.159191	ribosomal protein L3-like	0.079
102667	U70867	Hs.83974	solute carrier family 21 (prostaglandin transporter); member 2	0.079
111422	R01127	Hs.19104	ESTs	0.079
101411	M16938	Hs.820	homeo box C6	0.08
113267	T65058	Hs.12725	ESTs; Weakly similar to !! ALU SUBFAMILY J WARNING ENTRY !! [H.sapiens]	0.08
103559	Z19585	Hs.75774	thrombospondin 4	0.08
131588	AA258613	Hs.29189	KIAA1021 protein	0.08
107821	AA020991	Hs.172856	ESTs	0.08
134278	H82839	Hs.81001	ESTs; Weakly similar to DY3.6 [C.elegans]	0.08
120893	AA369800	Hs.97058	EST; Highly similar to CMP-N-acetylneuraminic acid hydroxylase [H.sapiens]	0.08
108786	AA128999		zo8f12.s1 Stratagene neuroepithelium NT2RAMI 937234 Homo sapiens cDNA clone IMAGE:567119 3', mRNA sequence	0.08
106890	AA489245	Hs.88500	KIAA1066 protein; JSAP1 homolog (mouse); JIP3 homolog (mouse)	0.08
119760	W72267	Hs.58219	ESTs	0.08
132999	Y00787	Hs.624	interleukin 8	0.08
129156	AA028195	Hs.108973	dolichyl-phosphate mannosyltransferase polypeptide 2; regulatory subunit	0.08
121171	AA400008	Hs.161814	ESTs	0.08
103864	AA207264	Hs.181077	ESTs; Weakly similar to Miller-Dieker lissencephaly gene [H.sapiens]	0.08
128591	AA255537	Hs.102057	ESTs; Weakly similar to O-linked GlcNAc transferase [H.sapiens]	0.08
122172	AA435753	Hs.161854	EST	0.08
112802	R97647	Hs.174855	EST	0.08
107723	AA015967	Hs.60680	EST	0.08
113011	T23737	Hs.1600	chaperonin containing TCP1; subunit 5 (epsilon)	0.081
131279	AA089853	Hs.25197	STIP1 homology and U-Box containing protein 1	0.081
103190	X70083	Hs.58414	filamin C; gamma (actin-binding protein-280)	0.081

103956	AA292411	Hs.233348	ESTs	0.081
112706	R89828	Hs.138493	ESTs	0.081
126126	M85370		EST01884 Fetal brain, Stratagene (cat#936206) Homo sapiens cDNA clone HFBCH10, mRNA sequence.	0.081
130094	H43286	Hs.167017	gamma-aminobutyric acid (GABA) B receptor; 1	0.081
100800	HG3945-HT4215		Phospholipid Transfer Protein	0.081
108675	AA115240	Hs.61816	ESTs	0.081
129420	AA234259	Hs.99816	ESTs	0.081
129666	M77349	Hs.118787	transforming growth factor; beta-induced; 68kD	0.081
101645	M59807	Hs.943	natural killer cell transcript 4	0.081
130536	T17045	Hs.159492	spastic ataxia of Charlevoix-Saguenay (sacsin)	0.081
107732	AA016181	Hs.59752	ESTs	0.081
123071	AA482593	Hs.104285	ESTs	0.081
113537	T90457	Hs.191293	ESTs	0.081
101250	L34060	Hs.79133	cadherin 8	0.081
122521	AA449433	Hs.149227	ESTs; Weakly similar to PROLINE-RICH PROTEIN MP-3 [M.musculus]	0.081
133914	N32811	Hs.77542	ESTs	0.081
102038	U05659	Hs.477	hydroxysteroid (17-beta) dehydrogenase 3	0.081
110336	H40338	Hs.174094	ESTs; Weakly similar to !! ALU SUBFAMILY J WARNING ENTRY !! [H.sapiens]	0.081
118637	N70274	Hs.49822	ESTs	0.081
117966	N51589	Hs.94012	ESTs	0.082
104424	H87671	Hs.182320	ESTs; Weakly similar to Mouse 19.5 mRNA; complete cds [M.musculus]	0.082
100361	D78361	Hs.125078	Human mRNA for ornithine decarboxylase antizyme; ORF 1 and ORF 2	0.082
112974	T17291	Hs.101174	microtubule-associated protein tau	0.082
132832	D63482	Hs.57734	KIAA0148 gene product	0.082
132039	Z39489	Hs.3781	Homo sapiens BAC clone RG118D07 from 7q31	0.082
113272	T65383	Hs.12807	ESTs	0.082
104924	AA058532	Hs.28774	ESTs	0.082
111061	N58054	Hs.36859	ESTs	0.082
129269	R45977	Hs.163593	ribosomal protein L18a	0.082
102453	U48437	Hs.74565	amyloid beta (A4) precursor-like protein 1	0.082
126204	AI080388	Hs.134296	ESTs	0.082
116615	D80666	Hs.45203	ESTs	0.082
128856	AA219552	Hs.204144	ESTs; Modly smlr to tumor necrosis factor-alpha-induced prot B12 [H.sapiens]	0.082
112776	R95850	Hs.34494	ESTs	0.082
105494	AA256273	Hs.29288	Homo sapiens mRNA; cDNA DKFZp434P174 (from clone DKFZp434P174)	0.082
117000	H84718	Hs.112236	ESTs; Weakly similar to repressor protein [H.sapiens]	0.082
112656	R85260	Hs.133151	transient receptor potential channel 7	0.082
128963	J03890	Hs.1074	surfactant; pulmonary-associated protein C	0.083
116957	H79292	Hs.39960	ESTs	0.083
101057	K03430		Human complement C1q B-chain gene, exon A+1	0.083
121948	AA429452	Hs.98582	ESTs	0.083
130822	M80647	Hs.2001	thromboxane A synthase 1 (platelet; cytochrome P450; subfamily V)	0.083
122743	AA458674	Hs.99478	EST	0.083
114569	AA063316		zm2d1.s1 Stratagene corneal stroma (#937222) Homo sapiens cDNA clone IMAGE:512947 3' *similar* to TR:E198281 E198281 THIOREDOXIN REDUCTASE ;contains Alu repetitive element;, mRNA sequence	0.083
132270	U70671	Hs.43509	ataxin 2 related protein	0.083
108126	AA052951	Hs.47413	ESTs	0.083
102880	X04325	Hs.2679	gap junction protein; beta 1; 32kD (connexin 32; Charcot-Marie-Tooth neuropathy; X-linked)	0.083
115365	AA282089	Hs.88599	ESTs	0.083
114529	AA052980	Hs.206704	ESTs	0.083
135017	AA249586	Hs.9315	ESTs; Weakly similar to NEURONAL OLFACTOMEDIN-RELATED ER LOCALIZED PROTEIN [H.sapiens]	0.083
123776	AA610071	Hs.112813	ESTs	0.083
114454	AA021091	Hs.226208	ESTs	0.083
101246	L33799	Hs.202097	procollagen C-endopeptidase enhancer	0.083
107366	U78310	Hs.13501	pescadillo (zebrafish) homolog 1; containing BRCT domain	0.083
132779	T89601	Hs.95497	ESTs; Weakly similar to GLUCOSE TRANSPORTER TYPE 5; SMALL INTESTINE [H.sapiens]	0.083
129709	AA112209	Hs.1209	acyl-Coenzyme A dehydrogenase; long chain	0.083
115244	AA278767	Hs.914	Human mRNA for SB classII histocompatibility antigen alpha-chain	0.083
123253	AA490878	Hs.111334	ferritin; light polypeptide	0.083
128469	T23724	Hs.258677	EST	0.083
132220	AA431847	Hs.42409	ESTs; Highly similar to CGI-146 protein [H.sapiens]	0.083
111664	R17939	Hs.22344	ESTs	0.083
102354	U38268		Human cytochrome b pseudogene, partial cds	0.084
112828	R98774	Hs.194338	ESTs	0.084

110410	H47868	Hs.34024	ESTs	0.084
102620	U66052		Human clone W2-6 mRNA from chromosome X	0.084
102550	U58087	Hs.14541	cullin 1	0.084
108417	AA075716		zm89e5.s1 Stratagene ovarian cancer (#937219) H sapiens cDNA clone IMAGE:54512 3' similar to gb:X14723 CLUSTERIN PRECURSOR (HUMAN);, mRNA sequence	0.084
113299	T67285	Hs.13089	ESTs	0.084
117869	N49947	Hs.46990	ESTs	0.084
113734	T98484	Hs.18377	EST	0.084
133325	C00424	Hs.7101	periodontal ligament fibroblast protein	0.084
123368	AA505022	Hs.124838	ESTs	0.084
101615	M55153	Hs.8265	transglutaminase 2 (C polypeptide; protein-glutamine -gamma-glutamyltransferase)	0.084
119352	T65972	Hs.193365	ESTs; Moderately similar to alternatively spliced product using exon 13A [H.sapiens]	0.084
123828	AA620686	Hs.112884	EST	0.084
103611	Z38133	Hs.113973	myosin; heavy polypeptide 8; skeletal muscle; perinatal	0.084
131289	AA485697	Hs.25334	ESTs; Weakly similar to ION CHANNEL HOMOLOG RIC PRECURSOR [M.musculus]	0.084
128678	T15898	Hs.103535	ESTs	0.084
130814	AA256695	Hs.19813	ESTs	0.084
133391	X57579	Hs.727	inhibin; beta A (activin A; activin AB alpha polypeptide)	0.084
129322	AA437153	Hs.110407	ESTs; Weakly similar to coded for by C. elegans cDNA yk173c12.5 [C.elegans]	0.084
109284	AA196995	Hs.86092	ESTs	0.084
116689	F09222	Hs.66099	ESTs	0.085
100545	HG2147-HT2217		Mucin 3, Intestinal (Gb:M55405)	0.085
102634	U66711	Hs.77667	lymphocyte antigen 6 complex; locus E	0.085
111735	R25389	Hs.23856	ESTs; Weakly similar to FAST kinase [H.sapiens]	0.085
105181	AA190876	Hs.10974	ESTs; Moderately similar to unknown [R.norvegicus]	0.085
122681	AA455350	Hs.99401	EST	0.085
114543	AA056121	Hs.158419	ESTs	0.085
133597	AA425908	Hs.75139	partner of RAC1 (arfaptin 2)	0.085
121064	AA398647	Hs.97406	ESTs	0.085
122231	AA436369	Hs.197728	ESTs; Weakly similar to ZINC FINGER PROTEIN 135 [H.sapiens]	0.085
100309	D50550	Hs.95659	lethal giant larvae (Drosophila) homolog 1	0.085
101727	M73481	Hs.73883	gastrin-releasing peptide receptor	0.085
131226	AA165400	Hs.24476	ESTs	0.085
133580	AA095041	Hs.181073	ESTs	0.085
102792	U87964	Hs.227576	GTP binding protein 1	0.085
104976	AA086480	Hs.183669	ESTs; Weakly similar to !! ALU SUBFAMILY J WARNING ENTRY !! [H.sapiens]	0.085
120865	AA350631	Hs.96963	EST	0.085
106080	AA418046	Hs.35124	ESTs	0.085
128571	AA416819	Hs.101661	ESTs	0.085
101838	M92934	Hs.75511	connective tissue growth factor	0.085
128514	H84261	Hs.100843	ESTs; Weakly similar to similar to GTP-binding protein [C.elegans]	0.085
123099	AA485931	Hs.79	aminoacylase 1	0.085
134067	Y08200	Hs.78920	Rab geranylgeranyltransferase; alpha subunit	0.085
116967	H80336	Hs.40124	EST	0.085
110053	H12586	Hs.89563	nuclear cap binding protein 1; 80kD	0.085
114395	AA007313	Hs.110155	ESTs	0.085
107465	W44681	Hs.251385	murine retrovirus integration site 1 homolog	0.085
101983	S85655	Hs.75323	prohibitin	0.085
112544	R70948	Hs.29153	ESTs	0.086
111423	R01165	Hs.188507	ESTs	0.086
127918	AA806043	Hs.115396	Human germline IgD chain gene; C-region; C-delta-1 domain	0.086
107300	T40348	Hs.90488	ESTs	0.086
134947	R51194		yj71a08.r1 Soares breast 2NbHBst Homo sapiens cDNA clone IMAGE:154166 5' similar to gb:L11284 DUAL SPECIFICITY MITOGEN-ACTIVATED PROTEIN KINASE KINASE 1 (HUMAN);, mRNA sequence.	0.086
124579	N68345	Hs.127179	ESTs; Weakly similar to TERATOCARCINOMA-DERIVED GROWTH FACTOR 1 [H.sapiens]	0.086
130471	Z68280	Hs.183706	adducin 1 (alpha)	0.086
116596	D60755	Hs.92955	ESTs	0.086
105069	AA136345	Hs.23617	ESTs; Weakly similar to ZFOC1 gene product [H.sapiens]	0.086
102491	U51010		Human nicotinamide N-methyltransferase gene, exon 1 and 5' flanking region	0.086
130069	AA055896	Hs.146428	collagen; type V; alpha 1	0.086
130234	AA280413	Hs.157441	spleen focus forming virus (SFFV) proviral integration oncogene spi1	0.086
120540	AA262992	Hs.96417	ESTs	0.086
122508	AA449221	Hs.20432	ESTs	0.086

128054	AI205718	Hs.125416	ESTs	0.086
133020	AA053248	Hs.185182	ESTs; Highly similar to 40S RIBOSOMAL PROTEIN S10 [H.sapiens]	0.086
130056	AA017356	Hs.171900	armadillo repeat gene deletes in velocardiofacial syndrome	0.086
130504	U48865	Hs.158323	CCAAT/enhancer binding protein (C/EBP); epsilon	0.086
133978	W73859	Hs.78061	transcription factor 21	0.086
105265	AA227941	Hs.26088	ESTs	0.086
133035	T15965	Hs.6333	ESTs	0.086
100768	HG3636-HT3846		Myosin, Heavy Polypeptide 9, Non-Muscle	0.086
129338	T56800	Hs.47274	Homo sapiens mRNA; cDNA DKFZp564B176 (from clone DKFZp564B176)	0.086
132789	W23761	Hs.56876	ESTs	0.086
116099	AA456309	Hs.58831	regulator of Fas-induced apoptosis	0.086
100721	HG3355-HT3532		Peroxisome Proliferator Activated Receptor (Gb:Z30972)	0.087
112569	R73150	Hs.75270	GTP-binding protein homologous to Saccharomyces cerevisiae SEC4	0.087
130645	AA020942	Hs.17200	STAM-like protein containing SH3 and ITAM domains 2	0.087
100751	HG3527-HT3721		Luteinizing Hormone, Beta Subunit	0.087
134550	M27161	Hs.85258	CD8 antigen; alpha polypeptide (p32)	0.087
130885	AA338646	Hs.20912	adenomatous polyposis coli like	0.087
101446	M21302	Hs.56306	small proline-rich protein 2A	0.087
116287	AA487856	Hs.155829	KIAA0676 protein	0.087
134034	X89267	Hs.78601	uroporphyrinogen decarboxylase	0.087
130860	U66061	Hs.241395	protease; serine; 1 (trypsin 1)	0.087
109901	H04992	Hs.30499	ESTs	0.087
107537	Z20777	Hs.9857	ESTs; Weakly similar to peroxisomal short-chain alcohol dehydrogenase [H.sapiens]	0.087
133232	AA496030	Hs.6845	ESTs	0.087
108559	AA085161		zn12c5.s1 Stratagene hNT neuron (#937233) H sapiens cDNA clone IMAGE:54728 3' similar to TR:G1151228 G1151228 LPG1P. ;, mRNA seq	0.087
121288	AA401735	Hs.97340	EST	0.087
108844	AA132916	Hs.177961	Human Chromosome 16 BAC clone CIT987SK-A-388D4	0.087
129874	AA406488	Hs.181551	ESTs	0.087
105139	AA164543	Hs.110082	ESTs	0.088
124789	R43803	Hs.78110	ESTs; Weakly similar to F17A9.2 [C.elegans]	0.088
115923	AA441929	Hs.38205	ESTs	0.088
123640	AA609292	Hs.112681	ESTs	0.088
131607	AA351409	Hs.172740	microtubule-associated protein; RP/EB family; member 3	0.088
130064	T67053	Hs.181125	immunoglobulin lambda gene cluster	0.088
108752	AA127070	Hs.71055	ESTs	0.088
124249	H68077	Hs.108211	ESTs	0.088
100109	AJ000480	Hs.143513	phosphoprotein regulated by mitogenic pathways	0.088
104642	AA004662	Hs.184245	KIAA0929 protein Msx2 interacting nuclear target (MINT) homolog	0.088
131752	AA453311	Hs.31566	ESTs	0.088
114727	AA132545	Hs.190202	ESTs	0.088
120965	AA398089	Hs.179715	ESTs	0.088
100396	D84361	Hs.151123	Human mRNA for p52 and p64 isoforms of N-Shc; complete cds	0.088
106218	AA428451	Hs.91146	DKFZP586E0820 protein	0.088
111562	R09567	Hs.187569	ESTs	0.088
121219	AA400606	Hs.144344	EST	0.088
101187	L20316	Hs.208	glucagon receptor	0.088
101513	M28210	Hs.27744	RAB3A; member RAS oncogene family	0.088
116454	AA621071	Hs.42034	ESTs; Moderately similar to T-complex protein 10A [H.sapiens]	0.088
116171	AA463434	Hs.42658	ESTs	0.089
117500	N31909	Hs.44278	ESTs	0.089
119978	W88623	Hs.59190	EST	0.089
132005	D58231	Hs.173091	DKFZP434K151 protein	0.089
109914	H05529	Hs.194704	leucine-rich; glioma inactivated 1	0.089
130370	M55265	Hs.155140	casein kinase 2; alpha 1 polypeptide	0.089
104262	AF009801	Hs.105941	bagpipe homeobox (Drosophila) homolog 1	0.089
129708	AA417181	Hs.120858	ESTs	0.089
106398	AA447545	Hs.18268	adenylate kinase 5	0.089
120884	AA365356	Hs.97041	ESTs	0.089
130404	X72012	Hs.76753	endoglin (Osler-Rendu-Weber syndrome 1)	0.089
114072	Z38184	Hs.123633	ESTs	0.089
131470	X54938	Hs.2722	inositol 1;4;5-trisphosphate 3-kinase A	0.089
124573	N67935	Hs.194703	adaptor-related protein complex 4; mu 1 subunit	0.089
114717	AA131240	Hs.252014	EST	0.089
133806	M12759	Hs.76325	Human Ig J chain gene	0.09
130470	AA398552	Hs.15711	KIAA0639 protein	0.09
133182	Z80787	Hs.240135	H4 histone family; member J	0.09
116036	AA452572	Hs.43866	ESTs	0.09

132404	AA393903	Hs.4768	ESTs	0.09
122695	AA456048	Hs.89403	ESTs; Moderately similar to undulin 2 [H.sapiens]	0.09
125975	AA495891	Hs.152290	ESTs; Highly similar to PACAP type-3/VIP type-2 receptor [H.sapiens]	0.09
110783	N23669	Hs.26407	ESTs	0.09
129860	AA410343	Hs.129826	tetraspan transmembrane 4 super family	0.09
120740	AA302650	Hs.96654	EST	0.09
119564	W38206		Accession not listed in Genbank	0.09
134474	AA054746	Hs.8379	ESTs	0.09
119014	N95435	Hs.55144	ESTs	0.09
109791	F10669	Hs.13228	DRE-antagonist modulator; calsenilin	0.09
117605	N35073	Hs.44433	ESTs	0.09
121589	AA416627	Hs.191598	ESTs	0.09
104326	D81655	Hs.143067	ESTs	0.09
129861	N69507	Hs.129849	DKFZP564M182 protein	0.09
102795	U88667	Hs.198396	ATP-binding cassette; sub-family A (ABC1); member 4	0.09
119626	W49499	Hs.184456	ESTs; Wkly smlr to !! ALU SUBFAMILY SX WARNING ENTRY !! [H.sapiens]	0.09
110516	H56894	Hs.37368	EST	0.09
105382	AA236853	Hs.111801	Homo sapiens mRNA; cDNA DKFZp564H2023 (from clone DKFZp564H2023)	0.09
123754	AA609964	Hs.102021	ESTs	0.09
108008	AA039430	Hs.61920	ESTs	0.09
121057	AA398619	Hs.142375	ESTs; Moderately similar to putative envelope protein [H.sapiens]	0.091
123675	AA609474	Hs.112713	EST	0.091
135194	C20975	Hs.9613	ESTs; Highly similar to angiopoietin-related protein [H.sapiens]	0.091
127070	AA641812	Hs.190037	ESTs	0.091
134051	S67070	Hs.78846	heat shock 27kD protein 2	0.091
133382	AA112532	Hs.7247	ESTs	0.091
103615	Z46967	Hs.115460	calicin	0.091
118457	N66593	Hs.49230	EST	0.091
118504	N67334	Hs.50158	ESTs	0.091
112915	T10176	Hs.4254	ESTs	0.091
132088	AA470121	Hs.243960	HLA-B associated transcript-3	0.091
101504	M27288	Hs.248156	oncostatin M	0.091
112550	R71391	Hs.29074	ESTs	0.091
128551	H09058	Hs.237323	N-acetylglucosamine-phosphate mutase; DKFZP434B187 protein	0.091
112879	T03541	Hs.115960	ESTs	0.091
127079	AI364691	Hs.128628	ESTs; Moderately similar to CL3BC [R.norvegicus]	0.091
101993	U01062	Hs.77515	inositol 1;4;5-triphosphate receptor; type 3	0.091
113020	T23830	Hs.7303	ESTs; Weakly similar to PROHIBITIN [H.sapiens]	0.091
120465	AA251505	Hs.130861	ESTs	0.091
130152	U32645	Hs.151139	E74-like factor 4 (ets domain transcription factor)	0.091
104941	AA065169	Hs.17805	ESTs	0.091
110090	H16076	Hs.6915	ESTs	0.091
135375	AA480888	Hs.99741	ESTs; Weakly similar to BRAIN PROTEIN H5 [H.sapiens]	0.091
123799	AA620418	Hs.112861	ESTs	0.092
118966	N93438	Hs.76907	ESTs; Highly similar to HSPC002 [H.sapiens]	0.092
116969	H80633	Hs.143038	ESTs	0.092
125147	W38150		Accession not listed in Genbank	0.092
100836	HG4113-HT4383		Olfactory Receptor Or17-201	0.092
114726	AA132509	Hs.103827	EST	0.092
107311	T57738	Hs.174112	ESTs	0.092
112863	T03148	Hs.4610	EST	0.092
129290	AA521407	Hs.110095	ESTs	0.092
103384	X92762	Hs.79021	tafazzin (cardiomyopathy; dilated 3A (X-linked); endocardial fibroelastosis 2; Barth syndrome)	0.092
112508	R68213	Hs.28847	ESTs	0.092
111863	R37495	Hs.23578	ESTs	0.092
131184	AA452705	Hs.23954	ESTs; Weakly similar to KIAA0584 protein [H.sapiens]	0.092
107420	W26567	Hs.4775	ESTs	0.092
111768	R27606	Hs.24185	ESTs	0.092
112290	R53940	Hs.26016	ESTs	0.092
130581	AA481982	Hs.16258	ESTs; Weakly similar to RAS-RELATED PROTEIN RAB-5A [H.sapiens]	0.092
120744	AA302772	Hs.228649	EST	0.093
112226	R50761	Hs.25738	ESTs	0.093
116154	AA460951	Hs.57100	ESTs	0.093
102640	U67674	Hs.194783	solute carrier family 10 (sodium/bile acid cotransporter family); member 2	0.093
129797	X53595	Hs.1252	apolipoprotein H (beta-2-glycoprotein I)	0.093
102705	U77180	Hs.50002	small inducible cytokine subfamily A (Cys-Cys); member 19	0.093
132408	AA035547	Hs.47822	KIAA0380 gene product; RhoA-specific guanine nucleotide exchange factor	0.093
108441	AA079079		zm97c9.s1 Stratagene colon HT29 (#937221) Homo sapiens cDNA clone	

			IMAGE:545872 3' similar to contains element MER22 MER22 repetitive element ;, mRNA sequence	0.093
108145	AA054133	Hs.63085	ESTs	0.093
106466	AA449990	Hs.76057	lysophospholipase II	0.093
101697	M64358		Human rhom-3 gene, exon	0.093
121294	AA401958	Hs.240170	ESTs; Moderately similar to alternatively spliced product using exon 13A [H.sapiens]	0.093
117824	N49065	Hs.125201	ESTs; Weakly similar to B7 [M.musculus]	0.093
115771	AA422049	Hs.40780	ESTs	0.093
102303	U33053	Hs.2499	protein kinase C-like 1	0.093
131405	U79255	Hs.26468	amyloid beta (A4) precursor protein-binding; family A; member 2 (X11-like)	0.093
112909	T10069	Hs.101094	ESTs	0.093
124173	H41281	Hs.107619	ESTs	0.093
112488	R66896	Hs.28788	ESTs	0.093
130554	X59303	Hs.159637	valyl-tRNA synthetase 2	0.093
106413	AA447964	Hs.6311	ESTs	0.093
111711	R22891	Hs.7093	ESTs	0.094
117595	N34933	Hs.44664	EST	0.094
113813	W45174	Hs.31382	ESTs	0.094
107769	AA018449	Hs.125220	Homo sapiens DNA from chromosome 19-cosmids R30102:R29350:R27740 containing MEF2B; genomic sequence	0.094
114966	AA250743	Hs.92198	ESTs; Highly similar to calcium-regulated heat stable protein CRHSP-24 [H.sapiens]	0.094
130297	H94949	Hs.171955	trophinin-assisting protein (tastin)	0.094
109589	F02429	Hs.6581	ESTs	0.094
112592	R77631	Hs.29126	ESTs	0.094
102314	U34038	Hs.154299	coagulation factor II (thrombin) receptor-like 1	0.094
116128	AA459915	Hs.112193	mutS (E. coli) homolog 5	0.094
106809	AA479704	Hs.220324	Human DNA sequence from clone 283E3 on chromosome 1p36.21-36.33. Contains the alternatively spliced gene for Matrix Metalloproteinase in the Female Reproductive tract MIFR1; -2; MMP21/22A; -B and -C; a novel gene; the alternatively spliced CDC2L2 gene for	0.094
130607	AA043894	Hs.16603	ESTs	0.094
120592	AA281929	Hs.143974	ESTs	0.094
117230	N20535	Hs.43265	melastatin 1	0.094
105948	AA404597	Hs.7133	ESTs	0.094
101333	L47738	Hs.80313	p53 inducible protein	0.094
101909	S69265		Homo sapiens mRNA for PLE21 protein; complete cds	0.094
106959	AA497031	Hs.8657	ESTs; Highly similar to CTG7a [H.sapiens]	0.094
127034	AA352389		ESTs; Wkly smlr to glucose-6-phosphatase catalytic subunit [R.norvegicus]	0.095
134430	H52105	Hs.8309	KIAA0747 protein	0.095
120342	AA207105	Hs.45068	Homo sapiens mRNA; cDNA DKFZp434I143 (from clone DKFZp434I143)	0.095
104450	L77564	Hs.103978	serine/threonine kinase 22B (spermiogenesis associated)	0.095
130902	AA424530	Hs.21061	ESTs	0.095
102708	U77594	Hs.37682	retinoic acid receptor responder (tazarotene induced) 2	0.095
107373	U85773	Hs.154695	phosphomannomutase 2	0.095
123569	AA608952	Hs.195292	ESTs; Weakly similar to RNA helicase HDB/DICE1 [H.sapiens]	0.095
102687	U73379	Hs.93002	ubiquitin carrier protein E2-C	0.095
128888	AA034951	Hs.106893	ESTs	0.095
100283	D43642	Hs.2430	transcription factor-like 1	0.095
102747	U79303	Hs.82482	protein predicted by clone 23882	0.095
107798	AA019346	Hs.60918	EST	0.095
123565	AA608907	Hs.112614	EST	0.095
116010	AA449450	Hs.56421	ESTs; Weakly similar to Similarity to H.influenza ribonuclease PH [C.elegans]	0.095
117155	H97536	Hs.42391	EST	0.095
133094	AA115572	Hs.64746	chloride intracellular channel 3	0.095
113174	T54659	Hs.9779	ESTs	0.095
102016	U03270	Hs.122511	centrin; EF-hand protein; 1	0.095
130126	AB002318	Hs.150443	KIAA0320 protein	0.095
134813	X14767	Hs.89768	gamma-aminobutyric acid (GABA) A receptor; beta 1	0.095
132055	N69440	Hs.38132	ESTs	0.095
122229	AA436198	Hs.103902	ESTs	0.096
127574	AA907314	Hs.188905	ESTs	0.096
134432	AA053022	Hs.8312	ESTs	0.096
128052	AA878398	Hs.190491	ESTs	0.096
101637	M58285	Hs.132834	hematopoietic protein 1	0.096
103386	X92972	Hs.80324	protein phosphatase 6; catalytic subunit	0.096
133079	AA477561	Hs.6449	ESTs	0.096
120328	AA196979	Hs.104129	ESTs; Weakly similar to protease [H.sapiens]	0.096

107640	AA009815	Hs.257808	ESTs	0.096
123389	AA521176	Hs.221231	ESTs	0.096
103222	X74795	Hs.77171	minichromosome maintenance deficient (S. cerevisiae) 5 (cell division cycle 46)	0.096
111704	R22450	Hs.23396	ESTs; Highly similar to ZINC FINGER PROTEIN 140 [H.sapiens]	0.096
126856	AA306523		EST177475 Jurkat T-cells VI Homo sapiens cDNA 5' end, mRNA sequence.	0.733
127071	AA250806		ESTs	0.096
114550	AA056755	Hs.151714	ESTs	0.096
125955	AI356943	Hs.143761	ESTs	0.096
134363	M37033	Hs.82212	CD53 antigen	0.096
128550	W76492	Hs.170142	ESTs	0.096
122598	AA453465	Hs.99329	ESTs	0.096
118898	N90703	Hs.4236	KIAA0478 gene product	0.096
117661	N39092	Hs.44940	ESTs	0.096
120996	AA398281	Hs.143684	ESTs	0.096
123388	AA521172	Hs.134417	ESTs	0.096
106700	AA463929	Hs.28701	ESTs	0.096
112962	T16814	Hs.6828	ESTs	0.096
121262	AA401372	Hs.97723	ESTs	0.096
134551	R44839	Hs.8526	I-beta-1;3-N-acetylglucosaminyltransferase	0.096
112060	R43754	Hs.21164	ESTs	0.096
134678	AA039935	Hs.182595	dynein; axonemal; light polypeptide 4	0.096
100855	HG4234-HT4504		Methylenetetrahydrofolate Reductase	0.097
132414	N91193	Hs.48145	ESTs	0.097
112900	T08758	Hs.3813	ESTs	0.097
115989	AA447777	Hs.93135	ESTs	0.097
103561	Z21488	Hs.143434	contactin 1	0.097
131087	AA009738	Hs.22824	ESTs; Weakly similar to p160 myb-binding protein [M.musculus]	0.097
120293	AA190859	Hs.191428	ESTs	0.097
111830	R38081	Hs.25085	EST	0.097
113654	T95770	Hs.17666	ESTs	0.097
132675	AA179338	Hs.5476	serine proteinase inhibitor	0.097
120182	Z40125	Hs.91968	ESTs	0.097
132879	U16282	Hs.5881	ELL gene (11-19 lysine-rich leukemia gene)	0.097
134211	AA056681	Hs.80021	ESTs; Weakly similar to 62D9.p [D.melanogaster]	0.097
115448	AA284845	Hs.165051	ESTs	0.097
118118	N56901	Hs.47995	ESTs	0.097
107598	AA004528	Hs.169444	ESTs	0.097
128933	H01824	Hs.760	GATA-binding protein 2	0.097
114892	AA235988	Hs.86024	ESTs	0.097
101922	S75168	Hs.274	megakaryocyte-associated tyrosine kinase	0.097
105444	AA252374	Hs.19333	ESTs; Weakly similar to ATP(GTP)-binding protein [H.sapiens]	0.097
128155	AA926843	Hs.143302	ESTs	0.097
116276	AA485870	Hs.44914	ESTs	0.097
111964	R41227	Hs.21860	ESTs	0.097
135100	AA398926	Hs.251108	Homo sapiens mRNA; chromosome 1 specific transcript KIAA0493	0.097
124872	R69251	Hs.101506	EST	0.097
103084	X59932	Hs.77793	c-src tyrosine kinase	0.097
124138	H23199	Hs.107010	ESTs	0.098
130048	R31745	Hs.211612	SEC24 (S. cerevisiae) related gene family; member A	0.098
100208	D26129	Hs.78224	ribonuclease; RNase A family; 1 (pancreatic)	0.098
123537	AA608775	Hs.112589	ESTs	0.098
118999	N95019	Hs.55092	ESTs	0.098
119847	W80384	Hs.9853	ESTs	0.098
112819	R98618	Hs.35984	ESTs	0.098
131080	J05008	Hs.2271	endothelin 1	0.098
127353	AA190853	Hs.155360	ESTs	0.098
132068	X66365	Hs.38481	cyclin-dependent kinase 6	0.098
105744	AA293436	Hs.12909	ESTs	0.098
133680	M92357	Hs.101382	tumor necrosis factor; alpha-induced protein 2	0.098
122899	AA469960	Hs.178420	ESTs; Highly similar to WASP interacting protein [H.sapiens]	0.098
128700	U59286	Hs.103982	small inducible cytokine subfamily B (Cys-X-Cys); member 11	0.098
104393	H46486	Hs.226499	nesca protein	0.098
123320	AA496792	Hs.139572	EST	0.098
129169	N31641	Hs.109058	ribosomal protein S6 kinase; 90kD; polypeptide 5	0.098
135093	U51333	Hs.159237	hexokinase 3 (white cell)	0.098
113269	T65159	Hs.85044	ESTs	0.098
124283	H86783	Hs.194136	ESTs; Moderately similar to zinc finger protein RIN ZF [R.norvegicus]	0.098
114376	GMCSF		Accession not listed in Genbank	0.099
100881	HG4458-HT4727		Immunoglobulin Heavy Chain, Vdjc Regions (Gb:L23563)	0.099

116572	D45654	Hs.65582	DKFZP586C1324 protein	0.099
123956	AA621747	Hs.112847	EST	0.099
100818	HG4018-HT4288		Opioid-Binding Cell Adhesion Molecule	0.099
132754	W47419	Hs.56007	Human DNA from chromosome 19-specific cosmid F25965; genomic sequence	0.099
112741	R93080	Hs.35035	ESTs	0.099
112748	R93299	Hs.166492	ESTs	0.099
130858	S57235	Hs.246381	CD68 antigen	0.099
124870	R69233	Hs.101504	ESTs	0.099
125304	Z39833	Hs.124940	GTP-binding protein	0.099
121297	AA401995	Hs.97860	ESTs	0.099
128602	AA046103	Hs.102367	ESTs	0.099
124062	H00440	Hs.144524	ESTs; Weakly similar to signal transducer and activator of transcription 2 [M.musculus]	0.099
100547	HG2149-HT2219		Mucin (Gb:M57417)	0.099
105652	AA282505	Hs.19015	ESTs	0.099
133390	AA459945	Hs.72660	KIAA0585 protein	0.099
133503	M33195	Hs.743	Fc fragment of IgE; high affinity I; receptor for; gamma polypeptide	0.099
109461	AA232667	Hs.58210	ESTs	0.099
102068	U09117	Hs.80776	phospholipase C; delta 1	0.099
113464	T86931	Hs.16295	ESTs	0.099
104240	AB002368	Hs.70500	KIAA0370 protein	0.099
121113	AA399109	Hs.161813	ESTs	0.1
122896	AA469952	Hs.97899	ESTs; Weakly similar to dal2; len:343; CAI: 0.17; ALC_YEAST P25335 ALLANTOICASE [S.cerevisiae]	0.1
102405	U43148	Hs.159526	patched (Drosophila) homolog	0.1
103599	Z33905	Hs.81218	receptor-associated protein of the synapse; 43kD	0.1
121079	AA398719	Hs.14169	ESTs; Weakly similar to CREB-binding protein [H.sapiens]	0.1
115820	AA427487	Hs.39619	ESTs; Weakly similar to RETICULOCALBIN 1 PRECURSOR [H.sapiens]	0.781
125106	T95766	Hs.189760	ESTs	0.1
131373	N68116	Hs.26146	Down syndrome critical region gene 3	0.1
120224	Z41239	Hs.106960	ESTs	0.1
133090	AA448228	Hs.6468	ESTs	0.1
132300	AA133244	Hs.44234	ESTs	0.1
113129	T49384	Hs.8988	EST	0.1
110638	H73197	Hs.17241	ESTs	0.1
131364	R53255	Hs.26010	ESTs	0.1
105370	AA236476	Hs.22791	ESTs; Weakly similar to transmembrane protein with EGF-like and two follistatin-like domains 1 [H.sapiens]	0.238

TABLE 11A shows the accession numbers for those primekeys lacking unigeneID's for Table 11. For each probeset we have listed the gene cluster number from which the oligonucleotides were designed. Gene clusters were compiled using sequences derived from Genbank ESTs and mRNAs. These sequences were clustered based on sequence similarity using Clustering and Alignment Tools (DoubleTwist, Oakland California). The Genbank accession numbers for sequences comprising each cluster are listed in the "Accession" column.

Pkey: Unique Eos probeset identifier number
CAT number: Gene cluster number
Accession: Genbank accession numbers

Pkey	CAT number	Accession
100610	19864_1	AW161357 AI879062 AI928938 AW161097 AW161167 BE314465 AA351715 F07098 AA179034 F08510 F00653 AI936671 AA476718 AW772454 AI807703 R44253 AA976667 AI985186 AI650254 H38942 R84829 AA018724 AA001000 H85934 AA019126 H85609 AA017000 AA339355 AW950556 D51397 AA213981 BE548002 AI056359 AA001560 AW952113 AA317769 AI857477 AI857475 AW249771 AW162661 H38943 AA018628 R85885 AI984613 AI934765 AI796172 AW157488 AI929191 R85523 D51221 D53851 H85610 AI749674 F21582 AA323145 AA019127 AA687444 T06745 AI699293 H29532 AA214029 AA223656 NM_016834 X14474 R19697 H09695 R17455 R13812 R19056 AI681231 AI590200 R37671 AA861828 AI990023 AI935669 AW005821 AA324581 H17335 R37659 R42802 R46242 R60936 R59731 H28993 AA479907 R44570 AI890696 AA308884 AA507078 R41274 AI365507 T16348 AI560453 F03259 F04722 T16312 AA016081 AW073061 BE314824 W28930 R44098 R51045
100674	21517_2	AW403342 AW248986 BE561709 AA357312 BE311834 BE389496 BE294887 AW732696 BE047868 AI702383 BE019155 AI702367 BE408966 BE280458 BE313759 BE513492 BE535404 BE280258 AC005263 NM_007165 L21990 AW732711 AI564920 AW249094 BE265365 AW607186 AW607346 BE005217 H27211 U46230 BE260066 BE207043 BE546782 AW248659
108559	41469_9	AA085228 AA085161
100721	19818_1	L40904 NM_005037 X90563 AB005526 H21596 AA088517
100748	41861_1	X06096 X05826
100750	15759_1	BE157260 BE157265 R48118 H43827 Z17877 AW379070 AW291778 M20605 J03253 M14206 V00568 AI860465 AW296022 M13930 AL047400 J00120 BE018476 AW675223 T26980 F06694 R22709 R24720 H22753 AI903100 AI903094 AW937823 X00364 D10493 K01904 K01906 K00535 L00058 AA410662 AW384760 AA304930 AI680985 X00198 H58025 AW998901 AV653447 N31654 AW610357 AW610369 AW862480 BE223010 AW384172 AW384219 AW384171 AW384218 AA298522 BE140421 AW945162 AW751711 AA514409 AW747912 AI214214 W87741 AA972406 AA554513 BE302087 AI249030 AA477850 AV653129 AI281360 AI274110 W87861 AA641368 X66258 AI051600 AA877139 AA527483 AA857219 AI250782 AA625531 AA807892 AI278811 AI224033 H24033 AA593398 AW129709 R45453 N22772 AA235530 T29737 AI016409 AI688907 AA568370 AA722760 AI539329 AA550843 AW674698 AI538452 AI538453 AI337857 AA477744 AA464600 AI140319 AW949294 AI339781 AI828736 AA923634 AA344094 AI278350 AA975567 AA908416 AA857170 AW023520 R43413 R48004 F02958 AI989439 R11207 AA737307 D10493 AW950652 AI093842 AI474024 AA703369 R11264 M13930 M13930 M13930 M13930 M13930 J00120 M13930 M13930 X00364 J00120 R19507 AA639812
100751	24700_1	N32759 N29730 N30831 N32604 N31955 AI206390 H87574 R23494 AI186215 N30036 AI741512 J00117 NM_000737 AI453626 AA330974 AI188729 AI188604 AI188964 N30276 AI188947 AI188830 AI188303 AI200457 AI219166 AI192459 AI183280 AI189275 AI188639 AI186353 AI189616 AI184224 AI130720 AI188454 AI188391 AI148857 AI192447 AI209155 AI190013 AI206355 AI188721 AI189429 AI189364 AI186330 AI431595 AI189595 AI188781 AI148647 AI200022 AI221552 AI220923 AI188728 AA233034 AI189807 AI189641 AI219044 AI148774 AI200658 W71989 AI207360 AI188824 AI200559 AI200270 AA644163 AI199943 AI151301 AI189555 AI262724 AI148590 AI148695 AI126906 AI149163 K03183 K03189 AI189842 AI221014 N30608 AI186465 AI220865 AI188498 AI138226 AI189968 AI221019 AI138197 AI149426 AI148904 AI186218 AI188348 AI160579 AI198460 AI149039 AI160936 AI219055 AI184784 AI221580 AI161082 AI160814 AI123896 AI417614 AI126101 AI188872 AI149571 AI168533 AI149072 AI149467 AI131286 N30684 AI160705 AI160692 AI149559 AI273580 AI189442 AI138448 AI149591 N27302 AA400910 AI138431 AI138435 AI128407 N30216 AI128296 AI219589 AI188492 AI149447 AI168482 H95374 AI219009 N31616 AI276216 N32233 AI291937 N30741 AI188689 N27111 R23214 AI221605 AI184348 AI200375 H94451 N26397 AI871881 AA232905 N30833 AI220780 H94446 N30822 H87464 R68815 N30290 AI128424 H12587 T47334 H87631 H87156 AI219133 AI868741 AA330859 H86993 AA330413 H93656 N30817 T90191 H93668 AI200054 H95207 T47316 H95381 T49170 R00880 T49171 N27381 H94107 R63352 T85053 AW451899 H95142 N30313 H94015 H86987 T28278 N29701 C18834 AA331267 AA330939 AI654493 N27073 N29831 R68113 N30758 R26088 N32108 H95135 AA330414 AA330978 AI219422 AI189453 AI199951 X00264 NM_000894 AA371909 AA063496 T29543 AA371971 AA372026 AA371978 AA371346 AI051683 AI188418 AI220659 AI189068 AI219268 AI186552 AI188715 AI149156
100760	1334_7	AW794626 M27126 M27014
100775	18179_3	J05581 M61170 T27692 M34088 M34089 AW860335 AW579047 AW610437 AW610386 AW610422 AW610473 AW579078 AW604897 AW860163 AW579067 AW862410 AI816584 AW177757 AW602769 AI909790 AW860331 AI909787 AI909811

		AI909813 AW845083 AI905920 AW387919 BE140766 AI909279 AW369405 AA429321 AA429320 AA367451 AA847972 AW001137 AI567905 T84561 AI631295 AA151351 H02932 AI884519 AA367457 AW369421 AI678846 AW391803 AI610869 AW192838 AI922289 AI952140 AI910233 AI479474 AW001395 AA488073 AI985760 AW130017 AI858369 AA627845 AW081805 AA158865 AI624443 AA344985 AA569793 R72486 AI589329 AI903204 AI269893 AA641284 AI279932 AA149270 AI697120 AA729146 AI589353 AA480067 AI923310 AA530908 AI275395 AA425062 AA580280 AA889527 AA158866 AW131341 AA573028 AA877326 T29335 AW951288 H04235 AA099243 AA994659 AI659618 AA887919 AI299297 AW001116 AW263844 AI270578 AA970828 AW572126 AA775299 AW369449 AW369398 AW369452 AI933677 AI870710 AI092911 AI582484 AI497674 AA937026 AA885865 L38597 AA908325 AW369432 AW026623 AA627778 AI264942 AA932409 AI187328 AI672970 AI886098 AW440471 AW138860 AI866858 AI802528 AI926172 AW243914 AI933690 AA996114 AA536189 AW009937 AI918060 AI270379 AI973169 AW175638 AW369413
100800	24735_1	NM_006227 L26232 R50649 AU077024 AL008726 AA411079 R35151 BE278153 BE278139 AI459777 R88036 Z43210 F07326 AF052157 R17844 BE615476 T82160 R71985 H21963 AA299158 AW368246 R48123 R50628 R70441 H27245 H72015 R72345 R39392 AI909738 BE612778 BE613234 D52116 D52136 D52132 D52067 D51922 D51995 D51905 N34249 N25459 AA464436 AA297350 AA297466 R81736 H02737 AW582505 R27523 AI834241 AW130867 W72668 W76426 AA358363 R50262 AW473860 H52335 H43953 H21964 T39505 AI887517 AW156925 AW839850 H02628 AW007705 AI561008 F22392 R71279 AA995433 R50725 W24462 R71931 AA464437 AW591731 R25667 R52695 R50810 AI560805 AI089266 H68386 H41353 H28590 AW001860 AI141623 AA250773 AI284778 AW511412 AW083975 AA130377 AW026047 R50551 R81494 AI357668 AI078272 F32666 F36981 AW304865 H43906 AA931068 R48010 AI540217 AI017339 AI291812 AI741954 AA458490 AI088378 AA298764 H61168 AA358362 AA298725 AA298515 AA464148 AA443538 R43046 AA084314 T40641 T47608 T48940 AI082477 AW470145 N92284 AI758858 AA298512 AA284588 AI597777 AA480277 AI932559 AI869081 AA476615 AA503651 AI656024 AW168522 AI682051 AI689106 AI274592 AI520917 BE258916 BE615861 BE280282 R53386 BE278255 BE278398 T47607 AA477662 H68385
100817	19648_1	L34355 L46810 NM_000023 U08895 AA424260 AI097272 AA424162 N79764 F19290 F25278 AI479385 AA460662 AA432059 AW016935 F25770 F32549 F36677 F33016 F35992 F36010 AW172497 AA835076 F28727 AA211643 AA453282
100818	19604_3	U79251 AA843851 R38201 R66461 R44908 AA683289 H17477 R37364 R52832 AW298336 AA351391 NM_002545 L34774 AA296886 AW967001 T28889 R13451 T77331 AL119196 AL118830 H08459 AW892812 AW905838 H17585 R52878
100881	458_127	BE561958 BE561728 BE397612 BE514391 BE269037 BE514207 BE562381 BE514256 BE514403 BE514250 BE397832 BE269598 BE559865 BE396881 BE560031 BE514199 BE560037 BE560454
100885	12707_3	X07881 NM_006249 X07637 AA376715 AA376677 X07715 X07704 S80916
100898	8542_1	BE387614 R51501 AA199714 AW674779 F08178 BE269071 AA376313 H08264 AA380420 H18785 AL042151 BE277758 BE267438 NM_005850 L35013 BE540833 BE390902 BE391494 BE277459 BE385592 BE390612 BE384263 BE387779 BE388647 BE537373 BE547158 AW409585 AW374033 AW602185 AA355725 AW577548 AW935015 AW935160 W40232 AW938647 AW374332 AA434040 BE293488 AL138361 BE560260 AI745075 AA317980 AW949382 AI834311 AI653582 AI831042 AI361878 AA618606 AA729052 AI424969 AA199715 AW769374 AI828422 AW044307 AI862816 AI203583 AW084461 AW514655 AA831883 AA290672 AA831286 AA578510 AW089965 AW150746 AA292743 H22232 AI469275 AW439312 AA292744 AW471443 AI473989 AA593336 AA464070 AI678937 AW069451 AA970763 AA610480 AA593328 AA464009 AA768985 AI298928 AA436600 AA464718 AA699361 D61482 D55935 AI369591 AA470695 AI809135 AA640627 AI568446 R51502 W45467 AI655316 AA463934 AW168609 AW518663 BE045525 Z41251 AI868091 AA908160 AI026697 AI886259 AI612932 AA215437 AI956014 BE541087 BE255652 BE265878 BE394102 W27502
102459	3556_1	U48936 L36592 X87160 NM_001039 AL036606 AL036420 U35630 AW298574
126126	1630017_1	W80551 M85370
102620	16821_37	AA976427 U66052
102673	24986_6	AI457548 U72509
102675	5145_4	U72512 T98357 R31335 F18090
102753	2226_1	L32961 NM_000663 U80226 S75578 AA425061 AA429317 AI815143 AA910669 AI286022 AI286019
102799	34624_4	U88896 U88898 AA916056 T03285 AI341594 AI359534 AI834031 U88897
127034	51148_2	BE397750 AA232171 BE562900 BE384894 BE242228 BE206819 BE261742 AA296468 AW959763 BE276164 BE264109 BE392626 BE256735 AA301453 N55872 H01676 AA292746 AA427485 AA496400 AA352389
103522	21640_1	Y10518 Y10514 Z83935 Y10508 AK000055 Y10519 AI142012 AI681175 BE222219 AA890586 BE504347 BE328064 N63044 N51226 AI151248 AI521996 AI924777 AW375954 AI860275 W00549 AI742673 AW612288 AI763062 AA632510 AI087347 AI088070 AI214349 AA890297 AI494156 AI698598 AA631658 AA504593 AA860733 AI266761 AW663214 AW771231 AA639610 AI769806 AI769746 AW014326 AI288611
127071	188097_1	AA250806 AA459220
126456	291985_1	AA429212 W00881
119388	1762256_1	T88798 R92430
126856	20669_1	AI084125 AI083773 AI479687 AI939609 AI968662 AF129507 NM_013282 AW971840 AW298508 AA744240 AA811217 AA827671 AA811055 AA806567 AA488977 AA908902 AI637637 AA927056 AI870139 AW340492 AA488755 AA129794 AA306523 AA354253 BE256277 AC053467 AW962084
103996	224545_1	AA321355 AW964592 R23284 H73883 R23382 N47914 C01377 H04668 AW606248 R34447 AA847136 AI684489 AI523112 AW044269 AI379138 N29366 AA761543 N79248 AA960845 AA768316 AI147926 AI718599 AI880620 R67467 AI216016 AI738663 H04648
113213	23798_1	NM_001395 Y08302 AI434619 AI470328 AI261807 AW024965 AI806537 AI830549 AI640337 AI219065 AW271700 AW028488 AI133339 AI859205 R51175 U87167 BE379324 BE392008 AA340819 AA343110 T57275 D59164 AW299312 AI434422 AI936390 AW024975 R40262
		AW269126 R09430 T56590 AI367247 AI253132 BE464248 T58658 AW207785 T58607
134947	844579_1	R51194 AI732276 R53587 AI820697
129311	16078_1	AK000526 BE550084 W30689 AW271859 AA411456 AI341551 AA242990 AA243027 H87046 D20360 AI184053 AA146956 AI721023 AI718944 AA146955 F18215 AA903890 AI700355 AI075430 AA411584 AA878210 AI476760 AW945637 AA630596

		AA431522 AA301989 AI909058 D12149 N41960 BE222214 AA609922 AA828176 AA393359 AA398693 AW024956 BE467805 AW298623 AW264085 AI024454 AI024719 AI431927 T55087 AI611014 T54920 AA131253 AI436344
114427	9724_2	AA017176 AI359979 AA047836 AA017063 AA016303 AA001545
114569	110077_1	AA063315 AA063316
100106	15621_-5	AF015910
100515	342_1	AA305746 D90187 T63943 AW951154 T29182 AI734941 D13264 AI299239 Z18812 AW299859 W24476 AA933064 AA489759
100531	46038_1	AW888554 AW607282 AA319986 M28590
100545	22955_11	M55405 AW752552
100574	17320_2	AA326895 M10036 NM_000365 N84665 H69414 N84657 AA380453 AA329743 AA357367 AA188770 AA376532 AA353653 AA158953 AA083176 BE537313 AA181433 D53373 R57376 AA206698 R14807 H18899 H11191 H93892 R25593 T61134 N93285 AA083081 AA831789 H13137 AA497014 AA079330 AA182861 H13138 W47161 R62913 AA687089 AA211112 AA429237 AL035923 AA100070 AW392898 AI566433 AA866006 AA214002 AW392865 N79454 AA197181 AI680371 AA176501 AA737967 AI089225 F34874 AW571437 AI620620 AA573489 AA423816 AA164917 AA458455 T47072 AI569087 AI261656 AA730919 AI633441 AW195182 AI351622 AW243465 AI872649 AI359227 AA987941 AI693770 T47073 AW779948 AW510580 AI635626 AW627601 AA864326 AA953578 AI341418 BE222853 AI241963 AI094663 AA928380 AA493373 AW043762 AI377783 AW958987 BE619760 AA385240 BE277975 BE280095 AW631443 AA581048 BE618715 BE299610 C14874 BE559858 BE378455 BE618290 BE544585 AI525575 BE548897 BE267110 AA804738 BE269821 AA918133 BE277647 AA599947 BE280735 BE390239 N74150 T12504 AI208197 AW955527 AA113897 N40081 H73835 H70393 AI434041 W22950 AI192661 BE264461 W26486 AA626424 AA196694 T69209 AA857976 AI540287 AA410599 AA864287 AW950564 AA013320 T49283 AI541438 AW804703 AA335534 AA335659 BE562269 BE618802 BE277850 BE546413 BE280994 AA204813 BE561694 BE543524 BE253647 AW001452 W19116 BE542508 AA205894 BE254875 BE270033 AI525906 BE251792 AA975700 BE272138 AW607671 N87686 M10036 BE515060 BE298607 AI745178 U47924 H03193
100627	tigr_HT2798	Z25424
100756	tigr_HT3768	M88357
100768	tigr_HT3846	L29141 M69180 M81105
100813	tigr_HT4265	L33999
100836	tigr_HT4383	U04688
100855	tigr_HT4504	U09806
102104	entrez_U12139	U12139
125091	genbank_T91518	T91518
100929	tigr_HT688	X65561
125147	_entrez_W38150	W38150
102354	entrez_U38268	U38268
102491	entrez_U51010	U51010
102636	entrez_U67092	U67092
118769	genbank_N74496	N74496
101046	entrez_K01160	K01160
101057	entrez_K03430	K03430
108334	genbank_AA070473	AA070473
108417	483241_1	AA070853 AA075749 AA075716
108441	genbank_AA079079	AA079079
108786	genbank_AA128999	AA128999
101655	entrez_M60299	M60299
101697	entrez_M64358	M64358
117437	genbank_N27645	N27645
101798	entrez_M85220	M85220
101909	entrez_S69265	S69265
103508	entrez_Y10141	Y10141
103575	entrez_Z26256	Z26256
119332	genbank_T54095	T54095
112161	genbank_R48295	R48295
119564	NOT_FOUND_entrez_W38206	W38206
114376	NOT_FOUND_entrez_GMCSF	GMCSF
100478	tigr_HT1067	M22406
100547	tigr_HT2219	M57417
100564	tigr_HT2324	Z11585

TABLE 12: shows genes, including expression sequence tags, that are down-regulated in prostate tumor tissue compared to normal prostate tissue as analyzed using Affymetrix/Eos Hu01 GeneChip array. Shown are the ratios of "average" normal prostate to "average" prostate cancer tissues.

Pkey:	Unique Eos probeset identifier number
ExAccn:	Exemplar Accession number, Genbank accession number
UnigeneID:	Unigene number
Unigene Title:	Unigene gene title
R1:	Background subtracted normal prostate : prostate tumor tissue

Pkey	ExAccn	UnigeneID	Unigene Title	R1
100522	HG1763-HT1780		Prolactin-Induced Protein	17.4
130803	M81650	Hs.1968	semenogelin I	16.785
118068	N53943	Hs.13743	ESTs	13.225
114251	Z39898	Hs.21948	ESTs	12.7
112134	R46025	Hs.7413	ESTs	8.735
101436	M20642	Hs.158295	Human alkali myosin light chain 3 mRNA; complete cds	8.175
104028	AA361094	Hs.221128	ESTs	8.15
108944	AA149204	Hs.175783	ESTs; Highly similar to growth arrest inducible gene product [H.sapiens]	7.535
103838	AA174173	Hs.12622	ESTs	7.212
120469	AA251741	Hs.25882	DKFZP586M1824 protein	7.175
110279	H29231	Hs.27384	ESTs	6.701
127472	AA761378	Hs.192013	ESTs	6.642
133301	N35229	Hs.7037	pallid (mouse) homolog; pallidin	6.411
102457	U48807	Hs.2359	dual specificity phosphatase 4	6.395
114011	W90385	Hs.15082	ESTs	6.15
101249	L33881	Hs.1904	protein kinase C; iota	6
123265	AA491209	Hs.105265	ESTs; Weakly similar to reverse transcriptase [M.musculus]	6
119322	T49655	Hs.241569	ESTs; Modly smlr to !! ALU SUBFAMILY SQ WARNING ENTRY !! [H.sapiens]	5.95
101673	M61906	Hs.6241	phosphoinositide-3-kinase; regulatory subunit; polypeptide 1 (p85 alpha)	5.925
115586	AA399218	Hs.92423	ESTs	5.7
120590	AA281780	Hs.111441	ESTs; Weakly similar to similar to Kruppel-like zinc finger protein [C.elegans]	5.7
109748	F10192	Hs.248323	Tubulin; alpha; brain-specific	5.625
134727	X80507	Hs.8939	yes-associated protein 65 kDa	5.5
129171	AA234048	Hs.7753	calumenin	5.486
120390	AA233122	Hs.111460	ESTs; Highly similar to multifunctional calcium/calmodulin-dependent protein kinase II delta2 isoform [H.sapiens]	5.4
131699	R68657	Hs.90421	ESTs; Modly smlr to !! ALU SUBFAMILY SX WARNING ENTRY !! [H.sapiens]	5.279
104490	N71503	Hs.43087	ESTs; Weakly similar to dysferlin [H.sapiens]	5.266
102124	U14528	Hs.29981	solute carrier family 26 (sulfate transporter); member 2	5.151
109280	AA196635	Hs.86081	ESTs	5.134
109707	F09739	Hs.185701	Homo sapiens mRNA full length insert cDNA clone EUROIMAGE 21920	5.075
108087	AA045709	Hs.40545	ESTs	5.075
135006	M21665	Hs.929	myosin; heavy polypeptide 7; cardiac muscle; beta	5.055
119182	R80664	Hs.77067	ESTs	5.033
129806	R62444	Hs.173373	KIAA0931 protein	4.675
101435	M20543	Hs.1288	actin; alpha 1; skeletal muscle	4.626
125954	R93943		yt72c12.r1 Soares retina N2b4HR Homo sapiens cDNA clone IMAGE:275735 5',	4.6
113989	W87544	Hs.221184	ESTs	4.559
104432	J03460	Hs.99949	prolactin-induced protein	4.451
112326	R56068	Hs.4268	ESTs	4.45
119063	R16833	Hs.53106	ESTs; Weakly similar to !! ALU SUBFAMILY J WARNING ENTRY !! [H.sapiens]	4.45
130376	R40873	Hs.155174	KIAA0432 gene product	4.301
122484	AA448286	Hs.98074	ESTs; Highly similar to atrophin-1 interacting protein 4 [H.sapiens]	4.2
104142	AA447006		ESTs; Moderately similar to !! ALU SUBFAMILY SQ WARNING	4.175
129413	N32787	Hs.11123	ESTs; Moderately similar to hypothetical protein 2 [H.sapiens]	4.1
103678	Z84483		Human DNA sequence from PAC 46H23, BRCA2 gene region chromosome 13q12-13	4.05
114266	Z40186	Hs.26409	ESTs	4.05
115206	AA262491	Hs.186572	ESTs	4.048
123723	AA609749	Hs.112759	ESTs; Highly similar to unknown protein [R.norvegicus]	4.041
129130	H97893	Hs.172788	ESTs; Weakly similar to KIAA0512 protein [H.sapiens]	4.028

120217	Z41078	Hs.66035	ESTs	4.028
108536	AA084524		zn19d8.s1 Stratagene neuroepithelium NT2RAMI 937234 Homo sapiens cDNA	4.023
134460	AA400030	Hs.8360	ESTs; Weakly similar to !! ALU CLASS B WARNING ENTRY !! [H.sapiens]	3.925
120418	AA236010	Hs.26613	Homo sapiens mRNA; cDNA DKFZp586F1323 (from clone DKFZp586F1323)	3.91
132783	N74897	Hs.5683	DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide 15	3.889
125052	T80174	Hs.222779	ESTs; Moderately similar to similar to NEDD-4 [H.sapiens]	3.85
108600	AA099585	Hs.41175	ESTs	3.833
103099	X61100	Hs.8248	NADH dehydrogenase (ubiquinone) Fe-S protein 1 (75kD) (NADH-coenzyme	3.818
134948	H06773	Hs.93850	protein kinase; AMP-activated; gamma 2 non-catalytic subunit	3.792
120511	AA258144	Hs.221576	ESTs	3.779
111861	R37460	Hs.25231	ESTs	3.768
113966	W86600	Hs.9842	ESTs	3.75
131649	AA481254	Hs.30120	ESTs	3.708
129775	R94659	Hs.12420	ESTs	3.707
110191	H20568	Hs.27182	phospholipase A2-activating protein	3.7
112678	R87160	Hs.33665	ESTs	3.7
127115	AA375791	Hs.131894	ESTs	3.674
132892	W92797	Hs.59378	DKFZP434G162 protein	3.653
115023	AA252079	Hs.63931	dachshund (Drosophila) homolog	3.625
114932	AA242751	Hs.16218	KIAA0903 protein	3.62
106865	AA487228	Hs.19479	ESTs	3.614
134480	AA024664	Hs.83916	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex; 5 (13kD; B13)	3.613
124780	R42493	Hs.220839	ESTs	3.6
130631	AA025399	Hs.169737	ESTs	3.592
134154	AA211320	Hs.79404	neuron-specific protein	3.568
104160	AA455706	Hs.99722	ESTs; Weakly similar to 78 KD GLUCOSE REGULATED PROTEIN PRECURSOR	3.559
105524	AA258158	Hs.22153	ESTs; Weakly similar to KIAA0352 [H.sapiens]	3.542
110168	H19673	Hs.176586	ESTs	3.525
109480	AA233299	Hs.72158	ESTs	3.522
109585	F02367	Hs.27252	ESTs	3.5
115134	AA257107	Hs.194331	ESTs	3.5
116083	AA455653	Hs.44581	ESTs; Weakly similar to HEAT SHOCK 70 KD PROTEIN 6 [H.sapiens]	3.459
120524	AA261852	Hs.192905	ESTs	3.45
116932	H74330	Hs.150000	ESTs	3.425
130746	AA256976	Hs.18800	ESTs; Weakly similar to KIAA0579 protein [H.sapiens]	3.42
107513	X05451	Hs.158295	Human alkali myosin light chain 3 mRNA; complete cds	3.417
118641	N70298	Hs.49829	ESTs	3.407
126584	AI028384	Hs.127331	ESTs	3.399
105134	AA159953	Hs.22895	ESTs; Weakly similar to arylsulfatase B precursor [H.sapiens]	3.325
123502	AA600116	Hs.112526	ESTs	3.318
132389	N50866	Hs.47135	ESTs	3.317
105691	AA287097	Hs.75356	transcription factor 4	3.315
131505	H85897	Hs.27755	ESTs	3.309
120775	AA342104	Hs.96777	EST	3.3
105579	AA278824	Hs.19218	ESTs	3.295
128190	AA946876	Hs.148376	ESTs	3.292
100819	HG4020-HT4290		Transglutaminase	3.288
130217	D29956	Hs.152818	ubiquitin specific protease 8	3.273
130068	AA608903	Hs.106220	KIAA0336 gene product	3.269
134719	L07515	Hs.89232	chromobox homolog 5 (Drosophila HP1 alpha)	3.266
110277	H29209	Hs.151231	ESTs; Highly similar to FYVE finger-containing phosphoinositide kinase [M.musculus]	3.26
127354	AA416880	Hs.185797	ESTs	3.212
129173	R60523	Hs.109087	ESTs	3.197
127464	AA970504	Hs.146103	ESTs	3.179
124923	R94500	Hs.108046	ESTs	3.175
122465	AA448164	Hs.99153	ESTs; Highly similar to CGI-73 protein [H.sapiens]	3.151
122027	AA431302	Hs.98721	EST; Weakly similar to N-copine [H.sapiens]	3.151
103329	X85134	Hs.72984	retinoblastoma-binding protein 5	3.15
129937	M95767	Hs.135578	chitobiase; di-N-acetyl-	3.15
134197	AA057341	Hs.87889	helicase-moi	3.15
107764	AA018219	Hs.226923	ESTs	3.125
121775	AA421773	Hs.161008	ESTs	3.125
114768	AA149007	Hs.182339	Ets homologous factor	3.12
132381	N48818	Hs.46884	ESTs	3.11
123105	AA485973	Hs.143947	ESTs	3.104
121176	AA400080	Hs.97774	ESTs	3.1
125053	T80620	Hs.186473	ESTs	3.075
105909	AA401739	Hs.5111	ESTs	3.066

119767	W72562	Hs.58119	ESTs	3.057
115776	AA424038	Hs.58197	ESTs	3.056
111713	R22988	Hs.220950	ESTs	3.05
115301	AA280047	Hs.43948	ESTs	3.05
118448	N66412	Hs.49189	ESTs	3
106586	AA456598	Hs.256269	ESTs	2.995
110415	H48239	Hs.29739	ESTs; Weakly similar to RAS-RELATED PROTEIN RAB-3A [H.sapiens]	2.979
105173	AA182030	Hs.8364	ESTs	2.978
101102	L07594	Hs.79059	transforming growth factor; beta receptor III (betaglycan; 300kD)	2.976
110543	H58383	Hs.258544	ESTs	2.976
125593	R24464	Hs.202949	KIAA1102 protein	2.964
100824	HG4058-HT4328		Oncogene Aml1-Evi-1, Fusion Activated	2.957
106822	AA481068	Hs.31835	ESTs	2.95
131983	D11930	Hs.3592	ESTs	2.95
111221	N68869	Hs.15119	ESTs	2.936
113620	T93795	Hs.17252	EST	2.917
105220	AA210695	Hs.17212	ESTs	2.917
123234	AA490227	Hs.105252	ESTs	2.904
125250	W87465	Hs.222926	ESTs; Weakly similar to D2092.2 [C.elegans]	2.9
116196	AA465160	Hs.63386	ESTs	2.9
122100	AA432243	Hs.41086	ESTs; Weakly similar to OXYSTEROL-BINDING PROTEIN [H.sapiens]	2.896
111712	R22905	Hs.113716	ESTs	2.895
126589	W78107	Hs.187698	ESTs; Weakly similar to Yer140wp [S.cerevisiae]	2.895
111132	N64378	Hs.13149	ESTs; Highly similar to unknown function [H.sapiens]	2.894
115307	AA280300	Hs.191346	ESTs	2.886
108989	AA152263	Hs.18827	KIAA0849 protein	2.883
129486	H03686	Hs.220689	Ras-GTPase-activating protein SH3-domain-binding protein	2.879
119805	W73788	Hs.43213	ESTs	2.875
125721	R59881	Hs.7503	ESTs	2.871
103704	AA028171	Hs.153688	ESTs	2.868
128420	AI088155	Hs.14146	ESTs; Weakly similar to unknown [H.sapiens]	2.866
120571	AA280738	Hs.128679	ESTs	2.863
123059	AA482019	Hs.238202	EST	2.86
129462	D84239	Hs.111732	IgG Fc binding protein	2.856
125166	W45491	Hs.172609	nucleobindin 1	2.854
125992	W01626		za36e07.r1 Soares fetal liver spleen 1NFLS Homo sapiens cDNA clone	2.852
109431	AA227972	Hs.43635	ESTs	2.85
105077	AA142919	Hs.5558	ESTs	2.847
131388	R34531	Hs.92200	KIAA0480 gene product	2.846
121080	AA398720	Hs.177953	ESTs	2.838
112575	R73816	Hs.17385	ESTs	2.836
130244	R26206	Hs.153293	KIAA0701 protein	2.825
134698	AA427783	Hs.77910	3-hydroxy-3-methylglutaryl-Coenzyme A synthase 1 (soluble)	2.816
116355	AA504356	Hs.88650	ESTs	2.813
115316	AA280627	Hs.57846	ESTs	2.806
129677	U48736	Hs.198891	serine/threonine-protein kinase PRP4 homolog	2.8
130971	H20332	Hs.28707	signal sequence receptor; gamma (translocon-associated protein gamma)	2.799
115054	AA252863	Hs.87729	ESTs	2.795
130285	AA063546	Hs.202968	ESTs	2.792
124308	H93575	Hs.227146	Homo sapiens mRNA; cDNA DKFZp564J142 (from clone DKFZp564J142)	2.783
125502	AA732329	Hs.191959	ESTs	2.778
114800	AA159825	Hs.131887	ESTs; Weakly similar to ORF YNL227c [S.cerevisiae]	2.768
128625	AA242816	Hs.102652	ESTs; Weakly similar to KIAA0437 [H.sapiens]	2.766
130159	H51098	Hs.151310	PDZ domain protein (Drosophila inaD-like)	2.75
107127	AA620504	Hs.22119	ESTs	2.742
113547	T90746	Hs.15233	ESTs	2.734
104639	AA004622	Hs.18214	ESTs	2.727
127609	AA622559	Hs.150318	ESTs	2.726
106922	AA490984	Hs.10056	ESTs	2.725
124825	R52088		yg85c3.s1 Soares infant brain 1NIB Homo sapiens cDNA clone	2.725
124333	H98683	Hs.154054	ESTs	2.708
117634	N36421	Hs.107854	ESTs; Weakly similar to SODIUM- AND CHLORIDE-DEPENDENTGLYCINE TRANSP	2.706
101609	M54927	Hs.1787	proteolipid protein 1 (Pelizaeus-Merzbacher disease; spastic paraplegia 2; uncomplicated)	2.704
117142	H96908	Hs.42251	ESTs	2.7
112602	R79147	Hs.203365	ESTs	2.695
106828	AA481505	Hs.13797	ESTs	2.68
124377	N25996	Hs.179833	ESTs	2.675

101026	J04970		carboxypeptidase M	2.675
124560	N66393	Hs.102754	ESTs	2.675
124066	H02494	Hs.101615	ESTs	2.671
130281	R12777	Hs.15395	ESTs; Weakly similar to ARGINYL-TRNA SYNTHETASE [H.sapiens]	2.66
110949	N49602	Hs.13308	ESTs	2.65
111031	N54839	Hs.221085	ESTs; Highly similar to mediator [H.sapiens]	2.633
121770	AA421714	Hs.11469	KIAA0896 protein	2.63
134132	U32519	Hs.220689	Ras-GTPase-activating protein SH3-domain-binding protein	2.626
112424	R62452	Hs.191265	ESTs	2.625
122544	AA451679	Hs.194410	ESTs	2.625
134425	X90568	Hs.172004	titin	2.624
111114	N63391	Hs.9238	ESTs	2.619
116119	AA459242	Hs.44445	ESTs; Weakly similar to Kelch motif containing protein [H.sapiens]	2.615
112079	R44164	Hs.23014	ESTs	2.6
123033	AA481271	Hs.193945	ESTs	2.591
124196	H52617	Hs.144167	ESTs	2.586
125873	H14437		yi25a04.r1 Soares breast 3NbHBst Homo sapiens cDNA clone	2.58
117684	N40184	Hs.45050	ESTs	2.576
134938	D30037	Hs.168326	phosphotidylinositol transfer protein; beta	2.575
131822	AA215647	Hs.200332	ESTs	2.568
135185	U71203	Hs.96038	Ric (Drosophila)-like; expressed in many tissues	2.564
117690	N40467	Hs.93834	ESTs	2.557
118807	N78582	Hs.50732	protein kinase; AMP-activated; beta 2 non-catalytic subunit	2.552
121369	AA405657	Hs.128791	Human DNA sequence from clone 967N21 on chromosome 20p12.3-13. Contains	2.55
114860	AA235112	Hs.106227	ESTs; Moderately similar to similar to murine RNA-binding protein [H.sapiens]	2.549
121857	AA426017	Hs.62694	ESTs; Highly similar to DNA-REPAIR PROTEIN COMPLEMENTING	2.548
110190	H20560	Hs.244624	ESTs	2.548
132573	AA045333	Hs.51743	ESTs; Weakly similar to !! ALU SUBFAMILY SB2 WARNING ENTRY !! [H.sapiens]	2.542
109706	F09729	Hs.12780	ESTs	2.537
135109	AA410391	Hs.94592	klotho	2.525
132810	R37027	Hs.5737	KIAA0475 gene product	2.525
124879	R73588	Hs.101533	ESTs	2.525
103840	AA174190	Hs.50932	ESTs	2.525
119066	R22196	Hs.34492	ESTs	2.519
114833	AA234362	Hs.87310	ESTs; Moderately similar to CGI-86 protein [H.sapiens]	2.507
112998	T23555	Hs.103288	ESTs	2.5
123312	AA496258	Hs.99601	ESTs	2.499
121873	AA426270	Hs.145696	splicing factor (CC1.3)	2.491
123321	AA496884	Hs.23972	ESTs	2.491
107760	AA018042	Hs.95078	EST	2.483
102580	U60808	Hs.152981	CDP-diacylglycerol synthase (phosphatidate cytidylyltransferase) 1	2.481
103053	X56741	Hs.5947	mel transforming oncogene (derived from cell line NK14)- RAB8 homolog	2.475
124756	R38100	Hs.106294	ESTs	2.475
112936	T15665	Hs.6185	ESTs; Weakly similar to BcDNA.GH12174 [D.melanogaster]	2.475
125178	W58202	Hs.125731	ESTs	2.475
112423	R62447	Hs.22123	ESTs	2.471
123515	AA600323	Hs.112535	EST	2.462
102842	U95020	Hs.21903	calcium channel; voltage-dependent; beta 4 subunit	2.457
102400	U42390	Hs.171957	triple functional domain (PTPRF interacting)	2.455
113187	T56056	Hs.9992	ESTs	2.452
131687	L11066	Hs.3069	heat shock 70kD protein 9B (mortalin-2)	2.448
115314	AA280583	Hs.256501	ESTs	2.437
128211	AI206427	Hs.166707	ESTs; Highly similar to Ran-binding protein 2 [H.sapiens]	2.43
134281	L11005	Hs.81047	aldehyde oxidase 1	2.425
115985	AA447709	Hs.132094	ESTs; Moderately similar to putative transcription factor CA150 [H.sapiens]	2.425
111348	N90041	Hs.9585	ESTs	2.418
129430	AA258842	Hs.197877	Homo sapiens clone 23777 putative transmembrane GTPase mRNA; partial cds	2.418
133863	C13990	Hs.76930	synuclein; alpha (non A4 component of amyloid precursor)	2.417
111164	N66857	Hs.14808	ESTs; Weakly similar to !! ALU CLASS C WARNING ENTRY !! [H.sapiens]	2.416
132143	AA257056	Hs.7972	KIAA0871 protein	2.412
130330	M55047	Hs.154679	synaptotagmin 1	2.408
114219	Z39451	Hs.27389	ESTs	2.406
117101	H94043	Hs.24341	DKFZP586I1419 protein	2.403
125433	AA034325	Hs.54320	ESTs	2.4
111099	N62506	Hs.21958	ESTs	2.4
120323	AA195405	Hs.110347	Homo sapiens mRNA for alpha integrin binding protein 80; partial	2.397
118624	N69998	Hs.21801	ESTs	2.394
123570	AA608955	Hs.109653	ESTs	2.389
123562	AA608893	Hs.190065	ESTs	2.388

131546	AA262821	Hs.28578	muscleblind (Drosophila)-like	2.385
103143	X66141	Hs.75535	myosin; light polypeptide 2; regulatory; cardiac; slow	2.384
123645	AA609310	Hs.188691	ESTs	2.383
130123	AA001835	Hs.150390	zinc finger protein 262	2.379
131682	AA428368	Hs.30654	ESTs	2.378
115909	AA436666	Hs.59761	ESTs	2.375
125168	W45574	Hs.252497	ESTs	2.372
123973	C14805	Hs.182151	ESTs	2.361
135197	U76456		Homo sapiens tissue inhibitor of metalloproteinase 4 mRNA, complete cds	2.357
118689	N71545	Hs.184544	ESTs	2.357
107734	AA016225	Hs.93386	ESTs	2.354
124590	N69220	Hs.41381	ESTs; Weakly similar to ubiquitin hydrolyzing enzyme I [H.sapiens]	2.35
111163	N66850	Hs.17606	ESTs	2.348
112349	R58877	Hs.22665	ESTs; Moderately similar to dJ83L6.1 [H.sapiens]	2.345
129076	AA262179	Hs.169343	ESTs	2.345
134238	R81509	Hs.184571	splicing factor; arginine/serine-rich 11	2.341
116766	H13260	Hs.95097	ESTs	2.336
106331	AA436853	Hs.34795	ESTs	2.333
129003	AA443752	Hs.10784	ESTs	2.332
132368	AA599814	Hs.46637	ESTs; Weakly similar to cDNA EST yk289g5.5 comes from this gene [C.elegans]	2.332
124697	R06273	Hs.186467	ESTs; Modly smlr to !! ALU SUBFAMILY J WARNING ENTRY !! [H.sapiens]	2.322
120273	AA176688	Hs.221139	ESTs	2.313
127110	AA304993	Hs.100861	ESTs; Weakly similar to p60 katanin [H.sapiens]	2.307
105450	AA252621	Hs.93842	ESTs	2.301
119819	W74371	Hs.58383	ESTs	2.297
102302	U33052	Hs.69171	protein kinase C-like 2	2.288
130596	N74353	Hs.16475	ESTs	2.282
114161	Z38904	Hs.22385	ESTs; Weakly similar to KIAA0970 protein [H.sapiens]	2.278
130542	U64675		Human sperm membrane protein BS-63 mRNA, complete cds	2.277
104491	N71513	Hs.39328	ESTs	2.275
116988	H82527		ys69e12.s1 Soares retina N2b4HR Homo sapiens cDNA clone	2.275
126823	AA370120	Hs.7870	ESTs; Weakly similar to Ylr350wp [S.cerevisiae]	2.273
108800	AA129731	Hs.90424	ESTs	2.273
101310	L41607	Hs.934	glucosaminyl (N-acetyl) transferase 2; I-branching enzyme	2.269
126842	W19498	Hs.21085	ESTs	2.255
127251	AA936428	Hs.128638	ESTs	2.251
124647	N91947	Hs.125033	ESTs	2.249
127112	AI143906	Hs.125103	ESTs	2.247
101973	S82597	Hs.80120	UDP-N-acetyl-alpha-D-galactosamine:polypeptide	2.246
120999	AA398302	Hs.127437	ESTs	2.245
130225	AA599583	Hs.15299	HMBA-inducible	2.243
119980	W88678	Hs.249247	heterogeneous nuclear protein similar to rat helix destabilizing protein	2.243
124222	H61053	Hs.222844	ESTs	2.24
129199	H90914	Hs.128629	ESTs	2.236
106802	AA479101	Hs.16570	ESTs; Weakly similar to !! ALU SUBFAMILY SQ WARNING ENTRY !! [H.sapiens]	2.231
126160	N90960	Hs.247277	ESTs; Weakly similar to transformation-related protein [H.sapiens]	2.229
104627	AA001976	Hs.19603	ESTs	2.228
106474	AA450212	Hs.42484	Homo sapiens mRNA; cDNA DKFZp564C053 (from clone DKFZp564C053)	2.226
113096	T40927	Hs.8345	ESTs	2.225
135336	AA452822	Hs.99027	ESTs	2.225
135344	R62976	Hs.168491	ESTs; Moderately similar to TRF1-interacting ankyrin-related	2.225
126156	AA508354	Hs.118448	ESTs; Moderately similar to AKT3 protein kinase [H.sapiens]	2.222
128885	AA397841	Hs.180141	cofilin 2 (muscle)	2.218
107900	AA026385	Hs.176600	ESTs; Moderately similar to !! ALU SUBFAMILY SB2 WARNING	2.217
114481	AA033562	Hs.151572	ESTs	2.212
109292	AA199828	Hs.188662	ESTs	2.212
104257	AF006265	Hs.9222	estrogen receptor-binding fragment-associated gene 9	2.209
132932	T15482	Hs.6093	ESTs	2.204
127392	AA262728	Hs.14896	Homo sapiens clone 24590 mRNA sequence	2.204
104641	AA004652	Hs.18564	ESTs	2.2
122529	AA449828	Hs.99229	ESTs	2.195
124307	H93562	Hs.162395	proline synthetase co-transcribed (bacterial homolog)	2.193
133601	S95936	Hs.75155	transferrin	2.193
119904	W85709	Hs.128927	ESTs; Weakly similar to !! ALU SUBFAMILY SP WARNING ENTRY !! [H.sapiens]	2.192
100348	D64109	Hs.4994	transducer of ERBB2; 2 (TOB2)	2.185
126871	AA351779	Hs.200334	ESTs	2.18
127793	AI298835	Hs.30445	ESTs; Weakly similar to transcription regulator Staf-50 [H.sapiens]	2.178
105149	AA169253	Hs.8958	ESTs	2.177
121387	AA405648		zw39g8.s1 Soares_total_fetus_Nb2HF8_9w H sapiens cDNA clone IMAGE:772478	2.177

111836	R36228	Hs.25119	ESTs	2.175
133394	R16759	Hs.237225	ribosomal protein S5 pseudogene 1	2.175
123207	AA489697	Hs.145053	ESTs	2.175
129801	F11087	Hs.239668	ESTs	2.175
103393	X94612	Hs.41749	protein kinase; cGMP-dependent; type II	2.161
132415	AA043223	Hs.4815	nudix (nucleoside diphosphate linked moiety X)-type motif 3	2.157
106369	AA443828	Hs.25324	ESTs	2.157
122963	AA478446	Hs.69559	KIAA1096 protein	2.156
133473	M19309	Hs.73980	troponin T1; skeletal; slow	2.155
134257	C06270	Hs.8078	Homo sapiens mRNA; cDNA DKFZp586L081 (from clone DKFZp586L081)	2.155
135156	AA056012	Hs.9552	binder of Arl Two	2.151
104055	AA393755	Hs.117211	ESTs; Highly similar to CGI-62 protein [H.sapiens]	2.15
102313	U33921		HSU33921 Clontech adult lung cDNA library (HL1158a) Homo sapiens cDNA	2.15
109788	F10638	Hs.12432	Homo sapiens clone 24407 mRNA sequence	2.15
103507	Y10032	Hs.159640	serum/glucocorticoid regulated kinase	2.15
116000	AA448710	Hs.41327	ESTs	2.15
105858	AA399164	Hs.227676	ESTs; Moderately similar to !! ALU SUBFAMILY SQ	2.137
103153	X66534	Hs.75295	guanylate cyclase 1; soluble; alpha 3	2.137
126202	AA652238	Hs.199726	ESTs	2.135
115955	AA446121	Hs.44198	Homo sapiens BAC clone RG054D04 from 7q31	2.134
104164	AA458770	Hs.27023	KIAA0917 protein	2.132
108692	AA121270	Hs.82960	ESTs	2.128
122878	AA465341	Hs.99640	ESTs	2.126
134771	L13939	Hs.89576	adaptor-related protein complex 1; beta 1 subunit	2.125
104298	D31120	Hs.40368	adaptor-related protein complex 1; sigma 2 subunit	2.125
104840	AA039595	Hs.42458	Homo sapiens mRNA; cDNA DKFZp586C1817 (from clone DKFZp586C1817)	2.125
122180	AA435798	Hs.98835	ESTs; Moderately similar to putative ring zinc finger protein	2.125
131012	H01992	Hs.202949	KIAA1102 protein	2.125
134092	H17490	Hs.7905	ESTs; Highly similar to sorting nexin 9 [H.sapiens]	2.123
118617	N69666	Hs.183413	ESTs; Modtly smlr to !! ALU SUBFAMILY J WARNING ENTRY !! [H.sapiens]	2.123
107155	AA621202	Hs.7946	DKFZP586D1519 protein	2.12
130925	N71935	Hs.169378	multiple PDZ domain protein	2.12
135167	U63717	Hs.95821	osteoclast stimulating factor 1	2.118
105952	AA405263	Hs.181400	ESTs	2.109
110308	H38148	Hs.32775	ESTs	2.108
116368	AA521186	Hs.94217	ESTs	2.107
132939	U76189	Hs.61152	exostoses (multiple)-like 2	2.102
117881	N50073	Hs.84926	ESTs; Highly similar to B-IND1 protein [M.musculus]	2.1
121723	AA419622	Hs.104800	ESTs; Weakly similar to Mouse 19.5 mRNA; complete cds [M.musculus]	2.096
103500	Y09443	Hs.22580	alkylglycerone phosphate synthase	2.094
121429	AA406293	Hs.193498	ESTs	2.093
134632	AA398710	Hs.174139	chloride channel 3	2.091
129785	F10980	Hs.184780	ESTs	2.09
111065	N58193	Hs.18740	ESTs; Weakly similar to 1-evidence	2.089
114710	AA129931	Hs.79081	protein phosphatase 1; catalytic subunit; gamma isoform	2.083
132711	N73702	Hs.238927	ESTs	2.083
133377	R05490	Hs.7239	SEC24 (S. cerevisiae) related gene family; member B	2.079
124773	R40923	Hs.106604	ESTs	2.078
117759	N47587	Hs.97345	ESTs; Weakly similar to TROPOMODULIN [H.sapiens]	2.076
127386	AI457411	Hs.106728	ESTs	2.076
101167	L15309	Hs.193677	zinc finger protein 141 (clone pHZ-44)	2.075
109597	F02582	Hs.14474	ESTs	2.074
124390	N29325	Hs.7535	ESTs; Highly similar to COBW-like placental protein [H:sapiens]	2.07
116225	AA478609	Hs.47278	Human Chromosome 16 BAC clone CIT987SK-A-735G6	2.07
131243	R16667	Hs.24752	spectrin SH3 domain binding protein 1	2.069
130557	T90830	Hs.15981	ESTs; Weakly similar to line-1 protein ORF2 [H.sapiens]	2.067
134103	D14826	Hs.155924	cAMP responsive element modulator	2.064
108833	AA131866	Hs.61661	ESTs; Weakly similar to DY3.6 [C.elegans]	2.063
112286	R53765	Hs.158135	KIAA0981 protein	2.063
125624	AA165411		zq49a01.r1 Stratagene hNT neuron (#937233) Homo sapiens cDNA clone	2.061
124612	N72200	Hs.13913	ESTs	2.058
116335	AA495830	Hs.87013	ESTs	2.057
112248	R51361	Hs.23423	ESTs	2.056
115789	AA424754	Hs.43149	ESTs	2.056
107029	AA599219	Hs.187492	ESTs; Weakly similar to ALR [H.sapiens]	2.056
110294	H30270	Hs.165062	ESTs	2.054
120532	AA262354	Hs.186648	ESTs	2.054
118180	N59249	Hs.48349	ESTs	2.052
132018	AA293194	Hs.3737	ESTs	2.052

132617	AA171913	Hs.5338	carbonic anhydrase XII	2.05
131526	N36167	Hs.28274	ESTs	2.05
113254	T64438	Hs.11449	DKFZP564O123 protein	2.05
122785	AA459978	Hs.99508	ESTs	2.05
107203	D20426	Hs.5656	EST	2.05
105713	AA291321	Hs.184319	ESTs; Moderately similar to KIAA1006 protein [H.sapiens]	2.046
129385	D82675	Hs.110950	Homo sapiens clone 25007 mRNA sequence	2.042
119116	R43845	Hs.64595	DKFZP566E2346 protein	2.04
116405	AA600253	Hs.55601	ESTs; Highly similar to host cell factor 2 [H.sapiens]	2.04
125924	AA526849	Hs.82109	syndecan 1	2.039
105599	AA279442	Hs.143460	protein kinase C; nu	2.037
119741	W70205	Hs.43670	kinesin family member 3A	2.037
101449	M21494	Hs.118843	creatine kinase; muscle	2.036
107109	AA609943	Hs.32793	ESTs	2.034
117040	H89112		yw25e5.s1 Morton Fetal Cochlea Homo sapiens cDNA clone IMAGE:25328	2.034
132906	AA142857	Hs.234896	ESTs; Highly similar to geminin [H.sapiens]	2.031
105479	AA255546	Hs.23467	ESTs	2.027
102031	U04898	Hs.2156	RAR-related orphan receptor A	2.027
119846	W80363	Hs.58446	ESTs	2.024
124809	R46482	Hs.106875	ESTs	2.024
130286	AA041548	Hs.154023	KIAA0573 protein	2.023
124457	N50114	Hs.128704	ESTs	2.017
125144	W37999	Hs.24336	ESTs	2.017
120581	AA281257	Hs.125868	ESTs	2.014
104931	AA062731	Hs.108319	thyroid hormone receptor-associated protein; 150 kDa subunit	2.012
120548	AA278846	Hs.187634	ESTs	2.011
113933	W81362	Hs.30567	ESTs	2.011
123072	AA485041	Hs.104308	ESTs	2.009
123648	AA609323	Hs.112689	ESTs	2.008
116875	H67749	Hs.161022	EST	2.003
103179	X69398	Hs.82685	CD47 antigen (Rh-related antigen; integrin-associated signal transducer)	1.995
103478	Y07755	Hs.38991	S100 calcium-binding protein A2	1.995
111007	N53378	Hs.22543	ESTs	1.995
120470	AA251797		zs11f3.s1 NCI_CGAP_GCB1 Homo sapiens cDNA clone	1.989
112280	R53457	Hs.26040	ESTs; Weakly similar to fatty acid omega-hydroxylase [H.sapiens]	1.989
114127	Z38652	Hs.106961	ESTs; Weakly similar to TYL [H.sapiens]	1.988
129863	AA151005	Hs.129872	sperm surface protein	1.988
106320	AA436608		ESTs	1.988
108933	AA147224	Hs.71814	ESTs	1.986
105906	AA401633	Hs.22380	ESTs	1.982
109029	AA157911	Hs.72200	ESTs	1.982
118470	N66769	Hs.82781	ESTs	1.975
115358	AA281886	Hs.88923	ESTs	1.975
115257	AA279060	Hs.193516	B-cell CLL/lymphoma 10	1.974
126879	AA719776		zh38g04.s1 Soares_pineal_gland_N3HPG Homo sapiens cDNA clone IMAGE:414390	1.974
109547	F01479	Hs.26966	ESTs	1.973
127111	AA805726	Hs.220509	ESTs	1.969
101266	L36645	Hs.73964	EphA4	1.966
129319	AA037467	Hs.30340	ESTs	1.965
106211	AA428240	Hs.126083	ESTs	1.962
112753	R93696	Hs.169882	ESTs	1.961
120489	AA255538	Hs.190504	ESTs	1.959
129699	AA458578	Hs.12017	KIAA0439 protein; homolog of yeast ubiquitin-protein ligase Rsp5	1.956
105425	AA251129	Hs.24416	ESTs	1.953
134740	L37362	Hs.89455	opioid receptor; kappa 1	1.95
109324	AA210700	Hs.86405	Homo sapiens mRNA; cDNA DKFZp564P056 (from clone DKFZp564P056)	1.95
124303	H93043	Hs.107070	ESTs	1.95
102337	U36922		Human fork head domain protein (FKHR) mRNA, 3' end	1.948
109441	AA228100	Hs.86998	nuclear factor of activated T-cells 5	1.946
127364	AA179573	Hs.90061	progesterone binding protein	1.942
105255	AA227498	Hs.3623	ESTs	1.942
130672	L19783	Hs.177	phosphatidylinositol glycan; class H	1.942
104301	D45332	Hs.6783	ESTs	1.94
132442	R62589	Hs.167419	ESTs	1.939
105519	AA258063	Hs.23438	ESTs	1.937
132902	AA490969	Hs.168147	ESTs	1.936
118873	N69881	Hs.44577	ESTs	1.936
114124	Z38595	Hs.125019	ESTs; Highly similar to KIAA0886 protein [H.sapiens]	1.934
115075	AA255486	Hs.88045	ESTs	1.933

110695	H93483	Hs.124777	ESTs	1.931
105360	AA236209	Hs.187628	ESTs	1.931
124998	T56013	Hs.77910	3-hydroxy-3-methylglutaryl-Coenzyme A synthase 1 (soluble)	1.929
121816	AA424814	Hs.187509	ESTs	1.927
111717	R23241	Hs.110776	STAT induced STAT inhibitor-2	1.925
128874	H06245	Hs.106801	ESTs	1.925
109391	AA219699	Hs.184245	KIAA0929 protein Msx2 interacting nuclear target (MINT) homolog	1.913
126129	H82165	Hs.40334	ESTs	1.911
115553	AA369027	Hs.71414	ESTs	1.905
113811	W44928	Hs.4878	ESTs	1.905
108345	AA070906		zm66d1.s1 Stratagene neuroepithelium (#937231) Homo sapiens cDNA clone	1.904
120472	AA251875	Hs.104472	ESTs; Weakly similar to Gag-Pol polyprotein [M.musculus]	1.903
116602	D80063	Hs.241673	EST	1.901
121121	AA399371	Hs.189095	ESTs; Weakly similar to zinc finger protein SALL1 [H.sapiens]	1.9
125330	AA401804	Hs.114574	ESTs	1.896
130095	F01831	Hs.14838	ESTs	1.894
119782	W72982	Hs.58262	ESTs	1.894
104115	AA428090	Hs.26102	ESTs	1.893
131313	C17938	Hs.22370	Homo sapiens mRNA; cDNA DKFZp564O0122 (from clone DKFZp564O0122)	1.891
105583	AA278907	Hs.24549	ESTs	1.891
122825	AA461195	Hs.99580	ESTs	1.887
119495	W35390	Hs.55533	ESTs	1.886
130309	AA134289	Hs.15423	Homo sapiens BAC clone RG114B19 from 7q31.1	1.886
125628	AA418069	Hs.241493	natural killer-tumor recognition sequence	1.886
110611	H66947	Hs.14871	ESTs; Highly similar to gene ERCC5 protein [H.sapiens]	1.885
117301	N22569	Hs.43215	ESTs	1.884
131406	N92239	Hs.26471	Wnt inhibitory factor-1	1.881
126428	AA013312	Hs.64988	ESTs	1.881
120285	AA182882	Hs.111110	titin-cap (telethonin)	1.878
112724	R91753	Hs.17757	ESTs	1.878
103121	X63679	Hs.4147	translocating chain-associating membrane protein	1.875
124381	N26765	Hs.109008	ESTs	1.875
117226	N20468	Hs.177322	ESTs; Weakly similar to putative p150 [H.sapiens]	1.875
105610	AA279991	Hs.124691	ESTs; Weakly similar to trithorax homologue 2 [H.sapiens]	1.875
111229	N69113	Hs.110855	ESTs	1.875
120627	AA285079	Hs.190474	ESTs	1.873
107048	AA600012	Hs.10669	ESTs; Moderately similar to KIAA0400 [H.sapiens]	1.872
104041	AA381902	Hs.197114	RNA binding protein	1.872
115162	AA258368	Hs.227806	ras GTPase activating protein-like	1.872
102239	U26726	Hs.1376	hydroxysteroid (11-beta) dehydrogenase 2	1.87
100043	M10098	AFFX control: 18S ribosomal RNA		1.868
120296	AA191353	Hs.22385	ESTs; Weakly similar to KIAA0970 protein [H.sapiens]	1.867
129011	S72869	Hs.107932	DNA segment; single copy; probe pH4 (transforming sequence; thyroid-1;	1.867
134851	R44479	Hs.90232	KIAA0552 gene product	1.866
117392	N26175	Hs.93405	ESTs	1.864
114530	AA053027	Hs.191797	ESTs	1.863
123541	AA608794	Hs.112592	ESTs	1.863
124890	R78618	Hs.34145	ESTs; Weakly similar to RAS-RELATED PROTEIN RAB-8 [H.sapiens]	1.862
105299	AA233511	Hs.194720	ATP-binding cassette; sub-family G (WHITE); member 2	1.861
103560	Z20656	Hs.182787	myosin; heavy polypept 6; cardiac muscle; alpha (cardiomyopathy; hypertrophic 1)	1.861
113073	T33637	Hs.6841	ESTs	1.86
120407	AA235040	Hs.107283	ESTs	1.859
103892	AA243523	Hs.17155	ESTs	1.858
123795	AA620381	Hs.70488	ESTs	1.857
108524	AA084323	Hs.68138	ESTs	1.857
113953	W85812	Hs.187554	ESTs	1.856
110721	H97678	Hs.31319	ESTs	1.856
129426	AA412087	Hs.168272	EST; Highly smlr to prot inhibitor of activated STAT prot PIASx-alpha [H.sapiens]	1.853
112102	R44840	Hs.21303	ESTs	1.852
118502	N67317	Hs.50150	ESTs	1.852
107619	AA004955	Hs.60015	ESTs	1.851
100438	D87446	Hs.75912	KIAA0257 protein	1.85
120652	AA287312	Hs.191648	ESTs	1.85
121643	AA417078	Hs.193767	ESTs	1.843
117387	N26011	Hs.53810	ESTs	1.843
132084	Y12394	Hs.3886	karyopherin alpha 3 (importin alpha 4)	1.843
124449	N48593	Hs.121820	ESTs	1.841
120263	AA173440	Hs.193919	ESTs	1.838
127228	AA731036	Hs.3463	ribosomal protein S23	1.838

111837	R38447	Hs.24453	ESTs	1.835
128727	M64174	Hs.50651	Janus kinase 1 (a protein tyrosine kinase)	1.834
114439	AA018937	Hs.128629	ESTs	1.833
102332	U35637		Human nebulin mRNA, partial cds	1.83
126579	W72979	Hs.146082	ESTs	1.83
102341	U37122	Hs.8110	adducin 3 (gamma)	1.83
114246	Z39848	Hs.12079	ESTs	1.828
131757	D17532	Hs.316	DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide 6 (RNA helicase; 54kD)	1.823
108904	AA136521	Hs.71148	ESTs; Weakly similar to putative p150 [H.sapiens]	1.823
115084	AA255566	Hs.42484	Homo sapiens mRNA; cDNA DKFZp564C053 (from clone DKFZp564C053)	1.823
131957	AA609008	Hs.183232	ESTs	1.822
100131	D12485	Hs.11951	phosphodiesterase I/nucleotide pyrophosphatase 1 (homologous to mouse Ly-41 antigen)	1.822
124163	H30539	Hs.189838	ESTs	1.821
118204	N59859	Hs.48443	ESTs	1.821
107727	AA016021	Hs.173091	DKFZP434K151 protein	1.82
100357	D78156	Hs.241548	RAS p21 protein activator 2	1.82
116295	AA489016	Hs.91216	ESTs; Highly similar to partial CDS; human putative tumor suppressor [H.sapiens]	1.82
124833	R54112	Hs.128697	ESTs	1.817
122587	AA453255	Hs.6968	ESTs	1.817
114359	Z41589	Hs.153483	ESTs; Moderately similar to H1 chloride channel [H.sapiens]	1.815
111289	N72253	Hs.238246	ESTs	1.813
110826	N30068	Hs.15347	ESTs	1.812
104106	AA422123	Hs.42457	ESTs	1.811
130043	AA055404	Hs.193953	ESTs; Weakly similar to !! ALU SUBFAMILY J WARNING ENTRY !! [H.sapiens]	1.253
115864	AA432080	Hs.81200	ESTs	1.81
129737	AA056140	Hs.122684	ESTs	1.81
124477	N53158	Hs.102682	ESTs	1.809
100782	HG3740-HT4010		Basic Transcription Factor 2, 34 Kda Subunit	1.806
106101	AA421053	Hs.34395	ESTs	1.806
115479	AA287596		zs52h09.s1 NCI_CGAP_GCB1 H sapiens cDNA clone IMAGE:701153	1.804
116104	AA456635	Hs.78524	ESTs	1.804
114173	Z39050	Hs.21963	ESTs	1.804
132632	N59764	Hs.5398	guanine-monophosphate synthetase	1.803
119135	R49548	Hs.169681	death effector domain-containing	1.802
131559	N91087	Hs.28728	ESTs; Weakly similar to F55A12.9 [C.elegans]	1.801
126922	AA177138	Hs.161671	ESTs	1.8
117375	N25427	Hs.108812	ESTs	1.8
103571	Z25535	Hs.211608	nucleoporin 153kD	1.8
105978	AA406367	Hs.15973	ESTs	1.8
125904	H22372	Hs.163586	ESTs	1.799
133883	AA397915	Hs.77221	choline kinase	1.798
105777	AA348412	Hs.23096	ESTs	1.797
110166	H19480	Hs.174309	ESTs	1.796
105038	AA130273	Hs.7584	ESTs; Weakly similar to hypothetical protein; similar to [H.sapiens]	1.796
105427	AA251330	Hs.28248	ESTs	1.795
115278	AA279757	Hs.67466	ESTs; Weakly similar to BACN32G11.d [D.melanogaster]	1.794
133104	L13698	Hs.65029	growth arrest-specific 1	1.794
131170	N48674	Hs.23796	Human DNA sequence from clone 1052M9 on chromosome Xq25. Contains the	1.792
100136	D13540	Hs.22868	protein tyrosine phosphatase; non-receptor type 11	1.791
127263	AA331157		EST35035 Embryo, 6 week, subtracted (total cDNA) I Homo sapiens cDNA	1.79
114157	Z38878	Hs.24979	ESTs	1.79
125601	AI096717	Hs.247043	KIAA0525 protein	1.788
118472	N66818	Hs.42179	ESTs	1.787
112456	R63925	Hs.28464	ESTs	1.787
130236	N69682	Hs.51957	SC35-interacting protein 1	1.786
133297	AA600057	Hs.70266	KIAA0905 protein	1.784
125650	R40096	Hs.176578	ESTs	1.784
132056	T89386	Hs.38176	KIAA0606 protein; SCN Circadian Oscillatory Protein (SCOP)	1.783
129093	AA262710	Hs.108614	KIAA0627 protein	1.783
123176	AA489020	Hs.193424	ESTs	1.782
106340	AA441792	Hs.22857	chord domain-containing protein 1	1.781
100598	HG2463-HT2559		Guanine Nucleotide-Binding Protein G25k	1.779
104038	AA374532		EST86676 HSC172 cells I Homo sapiens cDNA 5' end, mRNA sequence	1.778
122235	AA436475	Hs.190104	ESTs	1.777
105104	AA151771	Hs.76941	ATPase; Na+/K+ transporting; beta 3 polypeptide	1.776
107601	AA004636	Hs.50223	ESTs	1.776
131467	W68255	Hs.27194	DKFZP434K171 protein	1.776
118449	N66413	Hs.172466	ESTs; Weakly similar to KIAA0775 protein [H.sapiens]	1.776

107969	AA034030	Hs.155212	methylmalonyl Coenzyme A mutase	1.775
115527	AA342079	Hs.252055	ESTs	1.775
132471	T16305	Hs.49349	beta-site APP-cleaving enzyme	1.775
105966	AA406105	Hs.5344	adaptor-related protein complex 1; gamma 1 subunit	1.774
127548	AA373091	Hs.93832	Homo sapiens clone 24483 unknown mRNA; partial cds	1.774
106217	AA428379	Hs.24870	ESTs	1.773
131214	N26777	Hs.172635	ESTs	1.773
106295	AA435664	Hs.8583	similar to APOBEC1	1.773
106328	AA436705	Hs.28020	KIAA0766 gene product	1.772
124661	N93797	Hs.3090	EphB1	1.772
122988	AA479166	Hs.105633	ESTs	1.772
115504	AA291948	Hs.42736	ESTs	1.771
105168	AA180208	Hs.16606	ESTs; Highly similar to CGI-32 protein [H.sapiens]	1.767
129153	AA188618	Hs.181461	ariadne; Drosophila; homolog of	1.766
105829	AA398290	Hs.21965	ESTs	1.764
101811	M86917	Hs.24734	oxysterol binding protein	1.764
100138	D13628	Hs.2463	angiopoietin 1	1.764
124704	R07335		ye96c1.s1 Soares fetal liver spleen 1NFLS Homo sapiens cDNA clone	1.763
122314	AA442257	Hs.192076	ESTs	1.762
109865	H02566	Hs.191268	Homo sapiens mRNA; cDNA DKFZp434N174 (from clone DKFZp434N174)	1.761
106206	AA428069	Hs.89519	KIAA1046 protein	1.758
107135	AA620782	Hs.23247	ESTs	1.757
105760	AA338960	Hs.28170	ESTs	1.756
106288	AA435536	Hs.24336	ESTs	1.756
103968	AA304566	Hs.3542	ESTs	1.756
129559	AA234945	Hs.11360	ESTs	1.756
117885	N50112	Hs.47023	ESTs	1.754
107032	AA599472	Hs.247309	succinate-CoA ligase; GDP-forming; beta subunit	1.754
124807	R45963	Hs.233811	ESTs; Weakly similar to ORF2 [M.musculus]	1.753
100276	D42047	Hs.82432	KIAA0089 protein	1.753
110924	N47938		yy84a09.s1 Soares_multiple_sclerosis_2NbHMSP Homo sapiens cDNA clone	1.751
133002	AF006082	Hs.62461	ARP2 (actin-related protein 2; yeast) homolog	1.751
132530	AA455917	Hs.50785	SEC22; vesicle trafficking protein (S. cerevisiae)-like 1	1.75
110759	N21671	Hs.19025	ESTs	1.75
106138	AA424515	Hs.33264	ESTs	1.75
107348	U43701	Hs.184776	ribosomal protein L23a	1.75
115867	AA432162	Hs.165986	DKFZP586B2022 protein	1.749
135398	AA194075	Hs.99908	nuclear receptor coactivator 4	1.747
113783	W19222	Hs.7041	ESTs; Weakly similar to !! ALU SUBFAMILY SQ WARNING ENTRY !! [H.sapiens]	1.747
134898	X98330	Hs.90821	ryanodine receptor 2 (cardiac)	1.745
132215	T10132	Hs.4236	KIAA0476 gene product	1.744
104229	AB002346	Hs.61289	synaptojanin 2	1.743
116166	AA461556	Hs.202949	KIAA1102 protein	1.743
115433	AA284252	Hs.58372	ESTs	1.743
114908	AA236545	Hs.54973	ESTs	1.742
127425	AA470941	Hs.143162	ESTs	1.741
131089	Z38807	Hs.22870	ESTs	1.739
113498	T88908	Hs.189746	ESTs	1.738
116710	F10577	Hs.70312	ESTs	1.735
127210	R51476		yg76f04.r1 Soares infant brain 1NIB Homo sapiens cDNA clone	1.733
120554	AA279654	Hs.194524	ESTs	1.733
129940	U18242	Hs.13572	calcium modulating ligand	1.732
117023	H88157	Hs.41105	ESTs	1.731
111700	R22212	Hs.23361	ESTs	1.731
116911	H72240	Hs.39292	ESTs; Moderately similar to KIAA0745 protein [H.sapiens]	1.731
106025	AA412063	Hs.6065	ESTs	1.728
108626	AA101984	Hs.61697	G-protein coupled receptor	1.726
111614	R12581	Hs.191146	ESTs	1.726
134134	L76703	Hs.173328	protein phosphatase 2; regulatory subunit B (B56); epsilon isoform	1.725
106886	AA489086	Hs.36545	ESTs	1.725
117998	N52136	Hs.93828	ESTs	1.725
121204	AA400422	Hs.55896	ESTs	1.725
121342	AA404995	Hs.192480	ESTs	1.725
131129	R27296	Hs.23240	ESTs	1.725
116235	AA479181	Hs.186726	ESTs	1.725
102423	U44754	Hs.179312	small nuclear RNA activating complex; polypeptide 1; 43kD	1.724
110273	H29050	Hs.24096	ESTs	1.722
108758	AA127395	Hs.222414	ESTs	1.722
110672	H88477	Hs.191178	ESTs	1.721

120271	AA176404	Hs.111092	ESTs; Weakly similar to ZINC FINGER PROTEIN 136 [H.sapiens]	1.72
100227	D28915	Hs.82316	interferon-induced; hepatitis C-associated microtubular aggregate prot (44kD)	1.719
129232	W69459	Hs.109655	sex comb on midleg (Drosophila)-like 1	1.719
134663	W73367	Hs.8750	ESTs	1.717
104902	AA055475	Hs.104143	clathrin; light polypeptide (Lca)	1.717
120582	AA281290	Hs.125287	ESTs; Weakly similar to BC331191_1 [H.sapiens]	1.717
134891	F03517	Hs.90787	ESTs	1.716
106219	AA428567	Hs.26613	Homo sapiens mRNA; cDNA DKFZp586F1323 (from clone DKFZp586F1323)	1.715
116372	AA521311	Hs.13854	ESTs	1.713
107570	AA001870	Hs.237323	N-acetylglucosamine-phosphate mutase; DKFZP434B187 protein	1.713
106198	AA427616	Hs.11803	ESTs	1.712
125136	W31479	Hs.129051	ESTs	1.712
104973	AA085676	Hs.6763	KIAA0942 protein	1.712
128710	J04813	Hs.104117	cytochrome P450; subfamily IIIA (niphedipine oxidase); polypeptide 5	1.711
123994	D20899	Hs.107127	Homo sapiens mRNA; cDNA DKFZp564G022 (from clone DKFZp564G022)	1.711
127871	AA766511	Hs.128848	ESTs	1.71
116089	AA455933	Hs.41324	ESTs	1.709
123337	AA504153	Hs.132797	ESTs; Weakly similar to ORF YGL050w [S.cerevisiae]	1.708
123619	AA609200	Hs.162686	ESTs	1.708
104781	AA026617	Hs.21610	ESTs; Highly similar to BAI1-associated protein 1 [H.sapiens]	1.707
115114	AA256468	Hs.88148	ESTs	1.705
117852	N49408	Hs.136102	KIAA0853 protein	1.705
127644	T57570	Hs.77039	ribosomal protein S3A	1.704
111359	N91273	Hs.27179	ESTs	1.702
131721	L36644	Hs.31092	EphA5	1.7
132438	F08925	Hs.48610	ESTs	1.7
132476	N67192	Hs.49476	Homo sapiens clone TUA8 Cri-du-chat region mRNA	1.7
130990	F02488	Hs.21917	KIAA0768 protein	1.7
128499	AA487503	Hs.100636	ESTs	1.698
120780	AA342337	Hs.241569	ESTs; Modtly smlr to !! ALU SUBFAMILY SQ WARNING ENTRY !! [H.sapiens]	1.697
132920	L06133	Hs.606	ATPase; Cu++ transporting; alpha polypeptide (Menkes syndrome)	1.696
135037	U77948	Hs.184122	general transcription factor II; I	1.696
110024	H11297	Hs.31050	ESTs	1.695
134415	AA329274	Hs.82911	protein tyrosine phosphatase type IVA; member 2	1.694
102223	U24685	Hs.148226	Human anti-B cell autoantibody IgM heavy chain variable V-D-J region (VH4) gene; clone E11; VH4-63 non-productive rearrangement	1.694
126712	AA205862	Hs.7942	ESTs	1.694
101507	M27492	Hs.82112	interleukin 1 receptor; type I	1.692
106291	AA435551	Hs.30824	ESTs	1.691
116826	H58691	Hs.8215	ESTs; Weakly similar to double-stranded RNA-binding nuclear protein DRSBP76 [H.sapiens]	1.69
135339	D59269	Hs.127842	Homo sapiens mRNA full length insert cDNA clone EUROIMAGE 783648	1.69
118250	N62602		yz75b6.s1 Soares_multiple_sclerosis_2NbHMSP Homo sapiens cDNA clone IMAGE:288851 3' similar to contains Alu repetitive element;, mRNA sequence	1.689
106470	AA450116	Hs.186180	ESTs	1.688
108203	AA057678	Hs.63408	ESTs	1.687
119748	W70313	Hs.126906	ESTs	1.686
116576	D51228	Hs.79404	neuron-specific protein	1.683
123035	AA481392	Hs.105166	ESTs	1.683
126668	AA011616	Hs.184086	ESTs	1.681
101512	M28209	Hs.250716	RAB1; member RAS oncogene family	1.678
102704	U76638	Hs.54089	BRCA1 associated RING domain 1	1.677
126218	AA256386	Hs.13649	Novel human gene mapping to chomosome 13; similar to rat RhoGAP	1.676
111180	N67277	Hs.9403	ESTs	1.676
105937	AA404342	Hs.173531	ESTs	1.675
114118	Z38520	Hs.175930	ESTs	1.675
109203	AA190634	Hs.108787	endoplasmic reticulum membrane protein	1.675
125245	W86608	Hs.7243	ubiquitin specific protease 24	1.675
102906	X06956	Hs.75318	tubulin; alpha 1 (testis specific)	1.675
125914	AA262925	Hs.180034	cleavage stimulation factor; 3' pre-RNA; subunit 3; 77kD	1.674
134294	U63289	Hs.81248	CUG triplet repeat; RNA-binding protein 1	1.674
109742	F10108	Hs.183333	ESTs	1.673
134674	D63876	Hs.87726	KIAA0154 protein	1.673
104079	AA402937	Hs.103238	ESTs	1.671
107554	AA001386	Hs.59844	ESTs	1.671
132439	AA243139	Hs.4863	Homo sapiens clone 25088 mRNA sequence	1.669
124515	N58172	Hs.109370	ESTs	1.668
124300	H92575	Hs.105959	ESTs; Weakly similar to !! ALU SUBFAMILY SQ WARNING ENTRY !! [H.sapiens]	1.668
126809	AA743475	Hs.171693	ESTs	1.667

106095	AA419547	Hs.11713	ESTs	1.664
101754	M77142	Hs.239489	TIA1 cytotoxic granule-associated RNA-binding protein	1.663
105188	AA192306	Hs.23926	ESTs	1.663
113582	T91371	Hs.16824	EST	1.661
119559	W38197		Accession not listed in Genbank	1.661
119961	W87535	Hs.59015	ring finger protein 9	1.657
123255	AA490890	Hs.105273	ESTs	1.657
111078	N59230	Hs.186574	ESTs	1.655
113082	T40528	Hs.8246	ESTs	1.654
119589	W44692	Hs.124177	ESTs	1.652
104308	D53639	Hs.77904	ribosomal protein S26	1.65
103073	X59417	Hs.74077	proteasome (prosome; macropain) subunit; alpha type; 6	1.65
124424	N35314	Hs.107265	ESTs	1.65
128890	AA096157	Hs.182364	ESTs; Weakly similar to 25 kDa trypsin inhibitor [H.sapiens]	1.65
119400	T92767		ye27d06.s1 Stratagene lung (#937210) Homo sapiens cDNA clone IMAGE:118955 3', mRNA sequence.	1.65
131631	AA486868	Hs.29802	slit (Drosophila) homolog 2	1.65
118229	N62339	Hs.180532	heat shock 90kD protein 1; alpha	1.649
118533	N67954	Hs.49413	ESTs	1.648
130666	AA476307	Hs.194035	KIAA0737 gene product	1.647
103093	X60708	Hs.44926	dipeptidylpeptidase IV (CD26; adenosine deaminase complexing protein 2)	1.647
128667	U69140	Hs.103419	fasciculation and elongation protein zeta 2 (zygin II)	1.646
112933	T15530	Hs.221439	ESTs	1.646
114546	AA056263	Hs.132747	ESTs	1.645
126705	AA579377	Hs.180532	heat shock 90kD protein 1; alpha	1.644
114399	AA007595	Hs.220937	ESTs	1.642
118836	N79820	Hs.50854	ESTs	1.64
100401	D85423		Homo sapiens mRNA for Cdc5, partial cds	1.64
105681	AA284865	Hs.171228	KIAA1040 protein	1.639
132526	AA460128	Hs.5074	similar to S. pombe dim1+	1.639
133809	AA034002	Hs.76359	catalase	1.639
115968	AA447083	Hs.134522	ESTs	1.637
116370	AA521256	Hs.236204	ESTs; Moderately similar to NUCLEAR PORE COMPLEX PROTEIN NUP107 [R.norvegicus]	1.631
109844	F04477	Hs.204802	ESTs; Moderately similar to GLYCERALDEHYDE 3-PHOSPHATE DEHYDROGENASE; LIVER [H.sapiens]	1.627
103427	X97303		H.sapiens mRNA for Ptg-12 protein	1.627
132186	T33888	Hs.221040	KIAA1038 protein	1.626
131428	U17838	Hs.26719	PR domain containing 2; with ZNF domain	1.626
126838	AA649257	Hs.188602	ESTs	1.625
114503	AA039568	Hs.188083	ESTs	1.625
121242	AA400857	Hs.97509	EST	1.625
122414	AA446885	Hs.99087	ESTs; Moderately similar to ZINC FINGER PROTEIN 141 [H.sapiens]	1.625
110632	H72344	Hs.171635	ESTs	1.624
111389	N95837	Hs.169111	ESTs; Weakly similar to L82A [D.melanogaster]	1.624
112449	R63802	Hs.124186	ring finger protein 2	1.623
113070	T33464	Hs.6298	ESTs	1.622
107229	D59284	Hs.34644	ESTs	1.618
132710	W93726	Hs.55279	protease inhibitor 5 (maspin)	1.617
124664	N94814	Hs.33540	ESTs; Weakly similar to KIAA0765 protein [H.sapiens]	1.617
130166	AA350690	Hs.151411	KIAA0916 protein	1.616
125040	T78451	Hs.199961	ESTs	1.615
132972	H39627	Hs.164967	ESTs; Weakly similar to !! ALU SUBFAMILY SB WARNING ENTRY !! [H.sapiens]	1.615
115873	AA433916	Hs.90093	heat shock 70kD protein 4	1.611
120408	AA235045	Hs.190151	ESTs	1.61
120934	AA383773	Hs.191500	ESTs	1.61
115259	AA279071	Hs.13453	splicing factor 3b; subunit 1; 155kD	1.609
134330	D20113	Hs.8185	ESTs; Highly similar to CGI-44 protein [H.sapiens]	1.607
115117	AA256492	Hs.49007	poly(A) polymerase	1.606
125162	W44682	Hs.109896	ESTs	1.605
103946	AA285246	Hs.111650	ESTs; Weakly similar to Prt1 homolog [H.sapiens]	1.604
133389	AA166917	Hs.72639	ESTs	1.603
115528	AA342301	Hs.53929	ESTs; Weakly similar to !! ALU CLASS B WARNING ENTRY !! [H.sapiens]	1.602
129704	W81301	Hs.12064	ubiquitin specific protease 22	1.602
109313	AA206800	Hs.86276	ESTs; Moderately similar to zinc finger protein dp [H.sapiens]	1.601
130457	U58091	Hs.155976	cullin 4B	1.6
123076	AA485211	Hs.190046	ESTs	1.6
115113	AA256460	Hs.44810	ESTs	1.6
117731	N46433	Hs.46609	ESTs	1.6

123344	AA504338	Hs.171857	ESTs	1.599
131798	X86098	Hs.3238	adenovirus 5 E1A binding protein	1.597
125370	AA256743	Hs.151791	KIAA0092 gene product	1.596
114918	AA236813	Hs.72324	ESTs; Highly similar to unknown [H.sapiens]	1.596
114807	AA160805	Hs.199832	ESTs	1.596
105103	AA151593	Hs.10130	ESTs	1.594
125004	T60120		yb68f02.s1 Stratagene ovary (#937217) Homo sapiens cDNA clone IMAGE:76347 3', mRNA sequence.	1.592
105658	AA282914	Hs.10176	ESTs	1.589
110455	H52172		yt85e8.s1 Soares_pineal_gland_N3HPG Homo sapiens cDNA clone IMAGE:23111 3' similar to contains Alu repetitive element;, mRNA sequence	1.589
119780	W72967	Hs.191381	ESTs; Weakly similar to hypothetical protein [H.sapiens]	1.587
126983	AA211537		zn55d01.r1 Stratagene muscle 937209 Homo sapiens cDNA clone IMAGE:562081 5', mRNA sequence.	1.586
134675	AA250745	Hs.87773	protein kinase; cAMP-dependent; catalytic; beta	1.584
105431	AA252033	Hs.15036	ESTs; Weakly similar to !! ALU SUBFAMILY J WARNING ENTRY !! [H.sapiens]	1.584
120187	Z40251	Hs.56974	ESTs	1.584
115830	AA428137	Hs.86434	ESTs	1.581
135069	AA456311	Hs.93961	ESTs; Weakly similar to !! ALU CLASS A WARNING ENTRY !! [H.sapiens]	1.581
122997	AA479295	Hs.106290	Kelch motif containing protein	1.581
119707	W67569	Hs.44143	ESTs; Weakly similar to SNF2alpha protein [H.sapiens]	1.58
131934	D80948	Hs.34922	ESTs	1.58
106141	AA424558	Hs.9302	phosducin-like	1.58
115271	AA279422	Hs.5724	ESTs	1.579
131468	R27598	Hs.27197	KIAA0797 protein	1.577
131165	R98173	Hs.23763	Max-interacting protein	1.575
117273	N21680	Hs.43047	ESTs	1.575
101569	M33772	Hs.182421	troponin C2; fast	1.575
116127	AA459703	Hs.79070	v-myc avian myelocytomatosis viral oncogene homolog	1.575
120022	W90625	Hs.58432	ESTs	1.575
117512	N32157	Hs.82207	ESTs	1.574
106511	AA452865	Hs.206713	UDP-Gal:betaGlcNAc beta 1;4- galactosyltransferase; polypeptide 2	1.573
116415	AA609204	Hs.27973	KIAA0874 protein	1.573
127879	AA810215	Hs.189079	ESTs	1.571
125211	W72798	Hs.103177	ESTs; Wkly smlr to cDNA EST EMBL:D32579 comes from this gene [C.elegans]	1.571
114746	AA135638	Hs.223756	ESTs	1.571
122698	AA456112	Hs.99410	ESTs	1.57
116765	H12636	Hs.121585	ESTs; Weakly similar to reverse transcriptase [H.sapiens]	1.568
130895	AA609828	Hs.21015	ESTs; Highly similar to tetracycline transporter-like protein [M.musculus]	1.568
114338	Z41366	Hs.40109	KIAA0872 protein	1.567
111005	N53076	Hs.5996	ESTs	1.567
128135	AA913491	Hs.189143	ESTs; Modrtly smlr to !! ALU SUBFAMILY J WARNING ENTRY !! [H.sapiens]	1.567
112046	R43365	Hs.22273	ESTs	1.566
132160	AA281770	Hs.184081	seven in absentia (Drosophila) homolog 1	1.566
111568	R10153	Hs.20561	ESTs	1.566
127775	H04106	Hs.179902	ESTs; Weakly similar to NG22 [H.sapiens]	1.566
115359	AA281936	Hs.88914	ESTs	1.566
121845	AA425734	Hs.165066	ESTs; Weakly similar to hypothetical protein [H.sapiens]	1.565
127854	AA769520		ESTs; Weakly similar to REGULATOR OF MITOTIC SPINDLE ASSEMBLY 1 [H.sapiens]	1.564
120287	AA187679	Hs.111114	ESTs	1.563
114940	AA243012	Hs.75928	ESTs	1.562
126716	AA031700	Hs.251962	ESTs	1.562
134161	U97188	Hs.79440	IGF-II mRNA-binding protein 3	1.561
125390	H95094	Hs.75187	translocase of outer mitochondrial membrane 20 (yeast) homolog	1.561
115334	AA281244	Hs.65300	ESTs	1.559
113721	T97931	Hs.18190	EST	1.558
114895	AA236177	Hs.76591	KIAA0887 protein	1.558
119341	T62571	Hs.146388	microtubule-associated protein 7	1.558
108012	AA039616	Hs.61933	ESTs	1.558
130335	AA156499	Hs.8454	protein kinase; cAMP-dependent; regulatory; type II; alpha	1.557
134351	R82074	Hs.82109	syndecan 1	1.557
133300	D51401	Hs.70333	ESTs	1.553
106920	AA490899	Hs.24462	ESTs	1.553
118744	N74075	Hs.94293	EST	1.552
126489	W20016	Hs.144228	ESTs; Weakly similar to ZINC FINGER PROTEIN 83 [H.sapiens]	1.55
115913	AA436720	Hs.65487	ESTs	1.55
107868	AA025234	Hs.61260	ESTs	1.55
134520	N21407	Hs.257325	ESTs	1.55

109703	F09684	Hs.24792	ESTs; Weakly similar to ORF YOR283w [S.cerevisiae]	1.55
120288	AA187938	Hs.55189	ESTs; Weakly similar to F25B5.3 [C.elegans]	1.548
106356	AA443277	Hs.31034	peroxisomal biogenesis factor 11A	1.548
129460	AA235627	Hs.11171	APG5 (autophagy 5; S. cerevisiae)-like	1.547
133950	D11961	Hs.77823	ESTs	1.546
128172	AI400862	Hs.142607	ESTs	1.546
114162	Z38909	Hs.22265	ESTs	1.545
101803	M86546	Hs.155691	pre-B-cell leukemia transcription factor 1	1.544
113817	T93630	Hs.17207	ESTs	1.542
104896	AA054228	Hs.23165	ESTs	1.541
114477	AA032013	Hs.144260	EST	1.54
110731	H98653	Hs.188006	KIAA0878 protein	1.54
130367	Z38501	Hs.8768	ESTs; Wkly smlr to !! ALU SUBFAMILY SQ WARNING ENTRY !! [H.sapiens]	1.538
130539	L07044	Hs.250857	Homo sapiens calcium/calmodulin-dependent protein kinase II mRNA; partial cds	1.538
134921	W60186	Hs.169487	Kreisler (mouse) maf-related leucine zipper homolog	1.537
130583	W24957	Hs.16281	ESTs; Moderately similar to similar to C.elegans protein encoded in cosmid T20D3 [H.sapiens]	1.537
133723	AA088851	Hs.75744	S-adenosylmethionine decarboxylase 1	1.537
106450	AA449469	Hs.11859	ESTs	1.536
104120	AA429838	Hs.89519	KIAA1046 protein	1.536
100533	HG1879-HT1919		Ras-Like Protein Tc10	1.535
130664	R09049	Hs.17625	ESTs	1.535
127122	AA279153	Hs.190049	ESTs	1.535
134264	T03391	Hs.8087	ESTs	1.535
132319	AA418662	Hs.44625	ESTs	1.535
115465	AA286941	Hs.43691	ESTs	1.533
125003	T59442	Hs.100445	ESTs	1.532
102273	U30888	Hs.75981	ubiquitin specific protease 14 (tRNA-guanine transglycosylase)	1.532
121875	AA426299	Hs.98510	ESTs	1.532
114366	Z41747	Hs.469	succinate dehydrogenase complex; subunit A; flavoprotein (Fp)	1.531
132944	AA054515	Hs.6127	ESTs; Weakly similar to prostate-specific transglutaminase [H.sapiens]	1.53
111199	N68210	Hs.29822	ESTs	1.53
113494	T88878	Hs.258738	ESTs	1.529
129515	AA490882	Hs.112227	ESTs	1.528
133124	AA156049	Hs.65490	ESTs	1.528
104785	AA027163	Hs.7942	ESTs	1.526
105595	AA279408	Hs.25866	ESTs	1.526
130198	U67156	Hs.151988	mitogen-activated protein kinase kinase kinase 5	1.526
114297	Z40758	Hs.173091	DKFZP434K151 protein	1.525
112876	T03488	Hs.4842	ESTs	1.525
127500	AA525014	Hs.162115	ESTs	1.525
120519	AA258585	Hs.129887	cadherin 19 (NOTE: redefinition of symbol)	1.525
119859	W80702	Hs.58461	ESTs	1.525
129944	L00389	Hs.1361	cytochrome P450; subfamily I (aromatic compound-inducible); polypeptide 2	1.524
118864	N89670	Hs.42148	ESTs; Weakly similar to Su(P) [D.melanogaster]	1.523
123964	C13961	Hs.210115	EST	1.523
111676	R19414	Hs.166459	ESTs	1.522
128332	AI079523	Hs.134173	ESTs	1.522
130455	X17059	Hs.155956	N-acetyltransferase 1 (arylamine N-acetyltransferase)	1.521
125181	W58461	Hs.12396	ESTs	1.521
127093	AA768241		oa72d02.s1 NCI_CGAP_GCB1 Homo sapiens cDNA clone IMAGE:1317795 3', mRNA sequence.	1.521
132156	AA157401	Hs.4113	S-adenosylhomocysteine hydrolase-like 1	1.521
125303	Z39821	Hs.107295	ESTs	1.52
132697	AA281951	Hs.5518	Homo sapiens mRNA; cDNA DKFZp566J2146 (from clone DKFZp566J2146)	1.52
117086	H93135	Hs.41840	ESTs	1.519
113355	T79203	Hs.14480	ESTs	1.518
108621	AA101811	Hs.69506	ESTs	1.518
109384	AA219172	Hs.86849	EST	1.518
128510	X94703	Hs.100816	RAB28; member RAS oncogene family	1.517
132968	N77151	Hs.61638	myosin X	1.515
117035	H88798	Hs.41182	ESTs	1.515
116781	H22985	Hs.52132	ESTs	1.513
108677	AA115629	Hs.118531	ESTs	1.513
130214	H78003	Hs.15266	ESTs	1.513
134700	AA481414	Hs.8868	golgi SNAP receptor complex member 1	1.512
116618	D80783	Hs.45224	ESTs	1.508
126257	N99638		tumor necrosis factor receptor superfamily; member 10b	1.508
125859	AA806808	Hs.118797	ubiquitin-conjugating enzyme E2D 3 (homologous to yeast UBC4/5)	1.508

113837	W57698	Hs.8888	ESTs	1.507
114317	Z41038	Hs.469	succinate dehydrogenase complex; subunit A; flavoprotein (Fp)	1.507
100311	D50640	Hs.184653	phosphodiesterase 3B; cGMP-inhibited	1.507
126802	AA947601	Hs.97056	ESTs	1.506
128661	R82837	Hs.103329	KIAA0970 protein	1.506
134194	AA233231	Hs.79828	ESTs	1.506
108953	AA149652	Hs.42128	ESTs	1.504
133240	D31161	Hs.68613	ESTs	1.502
132671	X76302	Hs.54649	putative nucleic acid binding protein RY-1	1.501
132609	Z48923	Hs.53250	bone morphogenetic protein receptor; type II (serine/threonine kinase)	1.501
105574	AA278678	Hs.258567	ESTs	1.5
113718	T97782	Hs.256268	ESTs	1.5
127824	AI208365	Hs.127811	ESTs	1.5
130132	U55936	Hs.184376	synaptosomal-associated protein; 23kD	1.5
127394	AA453224		ESTs; Weakly similar to !! ALU SUBFAMILY J WARNING ENTRY !! [H.sapiens]	1.5
100485	HG1111-HT1111		Ras-Like Protein Tc21	1.5
101078	L04510	Hs.792	ADP-ribosylation factor domain protein 1; 64kD	1.5
128611	AA456845	Hs.102471	KIAA0680 gene product	1.5

TABLE 12A shows the accession numbers for those primekeys lacking unigeneID's for Table 12. For each probeset we have listed the gene cluster number from which the oligonucleotides were designed. Gene clusters were compiled using sequences derived from Genbank ESTs and mRNAs. These sequences were clustered based on sequence similarity using Clustering and Alignment Tools (DoubleTwist, Oakland California). The Genbank accession numbers for sequences comprising each cluster are listed in the "Accession" column.

Pkey: Unique Eos probeset identifier number
CAT number: Gene cluster number
Accession: Genbank accession numbers

Pkey	CAT number	Accession
108536	119811_1	AA084524 AA339253 AW966289
117040	46956_1	AW970600 AA503323 H89218 AF086031 H89112
100782	18457_1	AA355435 NM_001516 Z30093 T28405 AW949486 AA461142 AA410532 AI652073 AA521208 AI970141 AI968234 AI026102 AA713583 AW135876 AA936614 AA770300 AI242635 AA377033 AW960263 AW607683 AI273603 AA410287 AI040513 AA460838 AI803916 AW294095 AW449680 AW798677 AW675048 BE542116 AL120521
100819	3022_1	L34840 NM_003241 U31905 AI546931 AI791616 AI973065 AI792321 AI546937 AI685880 AI732835 AI682360 AA420653 AA564047 AI682323 AI824614 AI659889 AI680052 AI970887 AI623108 AA420692 AI418074 AA631018 AI810595 AW291463 AW449930 AI668908 AI970818
100824	5_36	AI393237 AI521317 AI761348 AF025841 D43968 AW994987 L34598 AF025841 D89789 D89788 D89780 AW998932 AI971742 AI310238 X90976 AW139668 AW674280 AI365552 AA877452 AV657554 C75229 AA376077 AI798056 AW609213 W25586 H30149 BE075089 BE075190 AW580858 H99598 AA425238 AA133916 AW363478 BE158121 BE158127 AW467960 BE158135 BE158126 BE158145 N92860 AA847246 AI961688 AI361423 AA878154 AA043767 AI863712 AI559226 AW339007 AI371266 AI368901 AA046624 AA134739 AW449154 AA130232 AI458720 AA962511 AI700627 R70437 AW004008 AA045229 AI671572 H99599 AA043768 AI685454 AI871685 N29937 X90977 AA524240 AI142114 AI825750 AI567805 AI631365 AI347893 AA134740 F20669 AA046707 AW793216 AW963298 AW959380 AA363265 AI784593 AI268201 R69451 AV657618 AI695588
125004	264197_1	BE312163 AJ230798 AA374482 AI926059 AA622653 AI860704 BE139185 AW296884 T60238 T60120
102313	27608_1	U33921 AI190489 AA573311
102337	553_1	AI814663 AA806761 AA765241 AA019317 AA092255 AA035405 T85079 AA890151 AI373959 T85080 BE153728 AA740848 BE080682 AL048137 AW182316 AI699468 AW274481 AW407538 AA306562 AW950024 AW949943 AL045703 AW843196 W25132 BE612794 AA304266 AW958054 H25673 AV646563 AV646573 BE172990 AW593488 AA385181 AA164998 AI246476 AA345406 AI277554 AA134749 AA856624 BE613247 AA299003 AL048138 AA028121 T92510 AI923835 AW020440 AI401594 AI889401 N93290 AA044247 AA028100 AI582845 AA811151 AI741811 AI925878 AA448277 AA172221 AI214783 BE220793 AA022746 AI082882 AA022849 AI928385 AA573472 AI420686 AW072902 AI799493 AI873506 AI468977 AI192079 AI468976 AA044272 AW015701 AW316979 AA933042 AA609017 AI318393 AI424571 AI934945 AA172023 AW050917 AA846180 AA134748 AI003947 AI766769 AW008697 AA853517 AW575680 AI474214 AA401478 U36922 AA927064 AA868000 D62654 T91745 AW500202 AA194764 AA746346 AA130464 AW117498 AA054526 N26432 H02534 H04964 AW303367 BE300931 AI218049 AI208073 AW182749 AA983630 AI147585 AA194765 AA054534 AA922720 AI436585 AI346535 AA134269 AA280923 AA897422 AA019559 AW274010 AA035406 AA917879 H99327 W32908 AI216046 AW496823 AA019414 H82288 W35284 AI936621 AI767113 AA866177 AW367874 H82398 AF032885 AW300151 AW467069 AA809346 AI188507 AI494178 AA872752 AI631631 U02310 NM_002015 AA815006 AI382453 AW197658 AI761654 AI804396 AI382221 AI813640 AI439635 AI523901 AW517242 AI221705 AW298104 AW204560 AW573095 AW028783 AW014650 AI766744 AI808294 AI698758 AI041809 AI766667 AI479103 AA872797 AA769305 AA765080 AA334166 AI472322
124704	292319_1	R07335 R07640
116988	185904_1	AW953679 AW953680 AA244436 H82527 AA361046 AA244483 H82526
124825	330773_1	AA501669 R52088
110455	46874_1	H52576 AF085971 H52172
126257	182217_1	N99638 AW973750 AA328271 H90994 AA558020 AA234435 N59599 R94815
125624	154135_1	AW968363 AA465492 R34539 AA165411
104038	264235_1	AA374532 AA421255
103427	43892_1	BE514383 AA071273 AW247987 AW673286 BE312102 AW749824 BE071985 AW577383 BE071945 BE072005 AW577355 BE071965 AW239231 BE072000 BE071960 AW577360 AW749830 AW373020 X97303 AW999522 BE000192 BE562219 BE266655 BE264970
104142	113242_1	AA074713 AA447006
127093	47721_1	AW977549 AA256038 AL365415 AW500455 AA768241 AW968097 Z17849 AA256104

125873	10492_1	AW271838 AL133605 C01646 H29959 AA999896 D60676 AW999454 AW961176 AA315244 H14437 AW386118 N46512 AW272021 AI768516 BE468421 AI082809 AI804454 AA905101 AW173368 N38942 AW614169 AI080483 N29489 AI500550 AA994475 AA614464 AA707368 AA593145 AA569473 AW627815 AI828244 N63226 N42300
125954	4457_1	NM_016353 AB023584 W44753 R09585 AA382865 R23772 AI814257 AA974046 AK001608 AI935638 AW440609 AI420022 AA777386 AA806969 AI554876 AI584006 AI688556 AI688634 AI697997 AI014540 AI806683 AI741202 AW263154 AW297238 AI149951 AI589076 AW082158 AW614265 AA931887 AA781969 R09490 AA484643 AI207121 AI088390 AI538065 AI619547 AI741925 AI702846 H40846 R93943 AW747979 AA461348 U30163 AA326023 AI535992 AW242870 AI244025 AI222558 W38425 AW473630 AI624599 AI921226 AI683152 AI096458 AI123822 AW170802 C16447 AI337674 D25726 AW339368 AW771259 AA461174
125992	1589048_1	H48372 W01626
127210	15307_6	AA305278 AA223833
110924	6443_1	AW058463 AF195766 AA680145 T86901 W60373 W60281 NM_007222 AF106862 AI000795 AA167188 AW884503 AW891313 AW891332 AW891312 AI984924 AI123518 N75170 AA131614 H25330 AI913358 AI742277 W25576 R58771 AW445159 AW888628 AW888627 AW274674 AI088482 N52314 N34282 AW001769 AI338943 T66784 AI288963 AW468676 AW237528 H25289 N71690 AA610128 AI143458 AI082599 N49144 AA854773 AW663411 AW610151 N47938 AW601626 AA167189 AA918304 AA805205 BE069496 AA652836 BE069499 AI699298 AW249926 AW888578 BE567635 T10726 AW604715 D54245 D53062 D55610 D55555 AA301376 AI133498 N77788 AI936320 AW090734 AI269977 N50828 AA550814 AI421993 AI005384 N50813 D60292 D59349 AA131710 D81698 D81699
127263	232161_1	AA331156 AA331157 AA331155
135197	29440_1	U76456 NM_003256 AF057532 AA193414 AW293304 AW963378 AA313095 AI359841 AI969312 AI080163 AW448926 AI671136 BE466399 AI637967 AI671873 AW196583 AW071635 AI634427 AW296872 AW292470 AA193650
127394	304844_1	BE161832 AA453224 AA485772
126879	1860_2	D90391 M55575 AI652268 AA719776
126983	171841_1	AA524886 AW971347 AA211537
120470	188975_1	AW971327 AA524988 AW628653 AA251797
127854	443883_1	AW976796 AA769520
121367	280429_1	AA432071 AA405648 AW000908 T16347
106320	6435_1	AB028957 AL120001 AI267678 H10928 R19844 AW970334 AA393182 F05472 F11711 H09908 N50250 AI815411 BE463679 D61468 AW970253 D60889 C15548 D61011 D60867 AI815795 AA534831 D81386 AW235039 AI382158 D81174 AA416899 AA852310 H09789 H10929 H09813 F09369 R44721 D51515 Z38456 R14004 T66255 F12148 F12139 AW351702 M85350 AI018713 AW972450 AW972645 AA514964 T66172 F09785 F09776 AA436608 T05327 T07118 AA339352
115479	201515_1	AW301608 N46706 AA649093 AA287595 AW811753 AA287596 N39260
101026	11075_1	NM_001874 J04970 T91426 AW205201 T84979 AA255727 AA847837 R02164 T91339 AV651884 AV651835 AV651350 AV650118 AV651338 AI272002 AI367796 AA830651 AA262112 AW151198
100401	24827_1	AU076696 AA219720 AL135197 AA305877 N56376 AA318063 AA130725 AW954903 BE541230 AW383312 U86753 D85423 AI679458 AI122932 AB007892 AI583919 BE160134 F08104 R34903 F13440 AA095444 AA262453 AA191036 R17895 T81266 BE149776 AI279537 AI143113 AA361072 AW959030 AW268817 AA811533 BE275179 AI221677 T65147 R49293 AA249176 BE000290 AA768053 F09494 BE092645 BE172099 Z41177 AA044750 AI909768 BE140795 BE140574 AW845210 AW752452 BE243244 AA843664 AI300080 BE169032 AW189979 BE004869 AA621872 AI951772 AI678897 AI926598 N62813 AI350912 AW608791 AI309602 AI983138 AW875592 AI655073 AW875626 AA130606 AI370827 C75528 C75554 AW263335 AI344426 BE004788 AA576220 AA604824 AI431405 AA749378 R38882 AW955075 AA173821 C75657 AA219672 AW768408 R43141 AI431414 AA483343 AI673792 T17294 AW770187 N74285 AI476404 AI088288 AA654152 AW974864 BE617311 BE243328 BE168049
130542	28089_3	U64675 AW167507 AW167508 BE218568 AA779360 W85722 AL044843 BE159404 AF012086 AW898611 AW898610 BE159405 BE092191 AW890826 AW369841 AW368064 AW606702 AL044731 R82691 AA419346 AA416558 H96045 AL040450 AI640531 AI808434 AL046613 AW855784 AW362469 AL048881 AL049015 AA094272 AA888908 AA417294 AW237786 R59793 AL044916 D82402 AI216854 AI079342 H96406 AL037845 AI915900 AA972133 AI478783 T31074 Z21135 Z21396 AA352182 R13918 AA430178 C17811 AI371824 AI742256 AA926801 N79156 AA350610 AA081971 N83639 R35544 AA312292 AW952080 N42322 AA171957 AA565297 R89207 AA504106 AI630782 AA826482 AI301579 T36241 AW966618 Z28426 AL043480 AI124636 AA393449 T19504 AW887823 AI289814 N53979 AL043571 AI632764 AI859613 AI986308 AI683212 AI984499 AI133258 C05898 AW512761 AI041260 BE466240 Z19161 AI351190 N67549 AI373374 AA400873 AW440914 AW514879 AA770146 AI358754 R51113 AI283773 AA649886 T30543 D54358 R37750 T03358 T15451 T15880 AA999689 N67396 AI056289 T85597 N62441 R89099 R00035 T85596 R61335 R00128 N63359 AI535964
100485	30576_2	AI207768 M31468 NM_012250 W01322 AA253280 AA253233 AA293148 AW582106 R79880 AA459547 AA363459 AA234396 N31669 H44468 AA434587 AW363088 AW993541
108345	112277_6	AA070906 AA070934
100522	19669_1	X51501 NM_002652 Y10179 J03460 AI791618 AI821473 AA916588 AA564296 AA916110 AI972286 AI420470 AI568790 AI597724 AW205207 AI659305 AI791620 AA532383 AI821475 AA526498
100533	32905_1	NM_012249 M31470 AL043108 AA262561 AA178883 T29433 AA313329 W48807 AW404323 AA453560 AW403227 H94816 W17101 AA165152 W23989 AA091310
100598	23902_2	AL121734 D54896 AA424269 BE242906 AA362118 BE018454 AI280348 AL048769 M35543 AA757734 AI128865 H20289 H23728 AI203445 H41481 H18237 H44081 H92839 AI928621 H75675 D51148 AI796198 AW390453 D55579 D54145 D53996 D54015 R37664 H17541 AA668681 T65061 R15867 AW468123 R16049 H69030 AA054226 H16070 F09655 R92144 T03521 R05473 H92840 AA018186 R91707
102332	14745_3	U35637 AA112989 Z19308
118250	genbank_N62602	N62602
103678	entrez_Z84483	Z84483
119400	genbank_T92767	T92767
119559	entrez_W38197	W38197

MISSING AT THE TIME OF PUBLICATION

TABLE 13: shows genes, including expression sequence tags, up-regulated in prostate tumor tissue compared to normal prostate tissue as analyzed using Affymetrix/Eos Hu02 GeneChip array. Shown are the ratios of "average" normal prostate to "average" prostate cancer tissues.

Pkey: Unique Eos probeset identifier number
ExAccn: Exemplar Accession number, Genbank accession number
UnigeneID: Unigene number
Unigene Title: Unigene gene title
R1: Background subtracted normal prostate : prostate tumor tissue

Pkey	ExAccn	UnigeneID	Unigene Title	R1
333516			CH22_FGENES.173_1	0.028
337954			CH22_EM:AC005500.GENSCAN.96-3	0.029
332496	R73299	Hs.204354	ras homolog gene family; member B	0.03
337944			CH22_EM:AC005500.GENSCAN.89-7	0.033
334111			CH22_FGENES.330_10	0.033
333657			CH22_FGENES.241_2	0.034
327718			CH.04_hs gi|6525284	0.034
336355			CH22_FGENES.817_5	0.035
322011	AL137354		EST cluster (not in UniGene)	0.035
336377			CH22_FGENES.821_5	0.036
300254	AW079607	Hs.188417	ESTs; Weakly similar to ZnT-3 [H.sapiens]	0.037
330096			CH.19_p2 gi|6015278	0.037
335191			CH22_FGENES.507_6	0.038
334040			CH22_FGENES.322_8	0.039
333586			CH22_FGENES.204_2	0.04
333295			CH22_FGENES.132_2	0.042
313326	AI088120	Hs.122329	ESTs	0.043
329517			CH.10_p2 gi|3983513	0.043
333403			CH22_FGENES.144_21	0.043
335226			CH22_FGENES.513_11	0.044
335976			CH22_FGENES.652_11	0.045
333637			CH22_FGENES.229_2	0.046
334582			CH22_FGENES.407_5	0.046
336437			CH22_FGENES.828_4	0.047
337461			CH22_FGENES.782-1	0.047
302892	N58545	Hs.6975	histone deacetylase 3	0.049
338689			CH22_EM:AC005500.GENSCAN.475-3	0.049
334721			CH22_FGENES.421_32	0.049
305867	AA864572		EST singleton (not in UniGene) with exon hit	0.049
335498			CH22_FGENES.571_7	0.05
311596	AI682088	Hs.223368	ESTs	0.05
326959			CH.21_hs gi|6469836	0.051
311688	AW025661	Hs.240090	ESTs	0.052
317298	AI922374	Hs.158549	ESTs	0.052
332984			CH22_FGENES.54_6	0.052
321039	AW247083		EST cluster (not in UniGene)	0.053
335844			CH22_FGENES.623_4	0.053
325371			CH.12_hs gi|5866920	0.054
335667			CH22_FGENES.590_18	0.054
333635			CH22_FGENES.228_2	0.054
336736			CH22_FGENES.110-2	0.055
335893			CH22_FGENES.635_1	0.055
333170			CH22_FGENES.94_5	0.055
329768			CH.14_p2 gi|6015501	0.055
334030			CH22_FGENES.320_2	0.055
323359	AA234172	Hs.137418	ESTs	0.055
300453	AW051431	Hs.113029	ribosomal protein S25	0.055
334262			CH22_FGENES.367_12	0.055
306590	AI000246		EST singleton (not in UniGene) with exon hit	0.055
331087	R22520	Hs.23398	ESTs	0.055
338620			CH22_EM:AC005500.GENSCAN.450-18	0.056
339045			CH22_DA59H18.GENSCAN.28-5	0.056
308023	AI452732		EST singleton (not in UniGene) with exon hit	0.057

339067			CH22_DA59H18.GENSCAN.33-3	0.057
335689			CH22_FGENES.596_4	0.057
339069			CH22_DA59H18.GENSCAN.33-5	0.057
338176			CH22_EM:AC005500.GENSCAN.219-4	0.057
328159			CH.06_hs gi|5868065	0.058
335655			CH22_FGENES.590_6	0.058
336371			CH22_FGENES.820_1	0.058
336558			CH22_FGENES.842_3	0.059
337738			CH22_EM:AC000097.GENSCAN.100-4	0.059
334273			CH22_FGENES.369_2	0.059
335889			CH22_FGENES.633_3	0.059
327807			CH.05_hs gi|5867968	0.059
333315			CH22_FGENES.138_7	0.059
338825			CH22_DJ246D7.GENSCAN.4-6	0.06
337612			CH22_C20H12.GENSCAN.22-5	0.06
333897			CH22_FGENES.293_4	0.06
335990			CH22_FGENES.655_4	0.06
334264			CH22_FGENES.367_15	0.06
338653			CH22_EM:AC005500.GENSCAN.460-39	0.061
322303	W07459		EST cluster (not in UniGene)	0.061
333498			CH22_FGENES.168_8	0.061
336522			CH22_FGENES.839_3	0.061
301357	AW295677	Hs.137840	ESTs; Moderately similar to HOMEOBOX PROTEIN SIX1 [H.sapiens]	0.062
305917	AA876469	Hs.181357	laminin receptor 1 (67kD; ribosomal protein SA)	0.062
336143			CH22_FGENES.705_5	0.063
333493			CH22_FGENES.168_2	0.063
332533	M99487	Hs.1915	folate hydrolase (prostate-specific membrane antigen) 1	0.063
325844			CH.16_hs gi|6552453	0.063
336402			CH22_FGENES.823_17	0.063
335767			CH22_FGENES.607_1	0.064
301893	T80334		EST cluster (not in UniGene) with exon hit	0.064
324019	AW177009		EST cluster (not in UniGene)	0.064
305801	AA845997		EST singleton (not in UniGene) with exon hit	0.064
335188			CH22_FGENES.507_3	0.065
337533			CH22_FGENES.828-2	0.065
333311			CH22_FGENES.138_3	0.065
335668			CH22_FGENES.590_19	0.065
306786	AI041589		EST singleton (not in UniGene) with exon hit	0.066
306365	AA962086		EST singleton (not in UniGene) with exon hit	0.066
306249	AA933840		EST singleton (not in UniGene) with exon hit	0.066
335018			CH22_FGENES.474_6	0.066
333594			CH22_FGENES.210_3	0.066
333900			CH22_FGENES.293_7	0.066
325207			CH.10_hs gi|6552430	0.067
329888			CH.15_p2 gi|6067149	0.067
326238			CH.17_hs gi|5867260	0.067
333658			CH22_FGENES.241_4	0.067
335809			CH22_FGENES.617_6	0.068
307427	AI243437		EST singleton (not in UniGene) with exon hit	0.068
318428	AI949409	Hs.224583	ESTs	0.069
327005			CH.21_hs gi|5867664	0.069
330463	HG998-HT998		Sulfotransferase, Phenol-Preferring	0.069
333318			CH22_FGENES.138_10	0.07
333313			CH22_FGENES.138_5	0.07
325937			CH.16_hs gi|5867132	0.07
335663			CH22_FGENES.590_14	0.07
335349			CH22_FGENES.539_2	0.07
303396	AA224470	Hs.25426	ESTs; Weakly similar to unknown [H.sapiens]	0.07
332603	N66681	Hs.33470	ESTs	0.07
333310			CH22_FGENES.138_2	0.071
309924	AW340812		EST singleton (not in UniGene) with exon hit	0.071
336340			CH22_FGENES.814_15	0.071
308025	AI453365	Hs.172928	collagen; type I; alpha 1	0.071
306805	AI055966		EST singleton (not in UniGene) with exon hit	0.071
335499			CH22_FGENES.571_8	0.071
329669			CH.14_p2 gi|6272129	0.071
321666	D28390		EST cluster (not in UniGene)	0.071
338174			CH22_EM:AC005500.GENSCAN.219-2	0.072

336556			CH22_FGENES.842_1	0.072
305451	AA738105	Hs.140	immunoglobulin gamma 3 (Gm marker)	0.072
336684			CH22_FGENES.46-1	0.072
326943			CH.21_hs gi|6004446	0.073
333947			CH22_FGENES.303_1	0.074
333214			CH22_FGENES.104_5	0.074
331917	AA446572	Hs.174007	ESTs; Moderately similar to !!!! ALU SUBFAMILY J WARNING	0.074
339102			CH22_DA59H18.GENSCAN.44-9	0.074
328122			CH.06_hs gi|5868031	0.075
332250	N62712	Hs.226223	KIAA0618 gene product	0.075
328506			CH.07_hs gi|5868471	0.075
331756	AA291468	Hs.98504	ESTs	0.075
335193			CH22_FGENES.507_8	0.076
317729	AA971718	Hs.128141	ESTs	0.076
304515	AA458708	Hs.251577	hemoglobin; alpha 2	0.076
313644	AI565766	Hs.124960	ESTs	0.076
326145			CH.17_hs gi|5867204	0.076
336394			CH22_FGENES.823_6	0.077
306516	AA989542		EST singleton (not in UniGene) with exon hit	0.077
300629	AA152119	Hs.155101	ATP synthase; H+ transporting; mitochondrial F1 complex; alpha subunit; isoform 1; cardiac muscle	0.077
333160			CH22_FGENES.91_2	0.077
337490			CH22_FGENES.799-5	0.077
305403	AA723748		EST singleton (not in UniGene) with exon hit	0.077
331747	AA281765	Hs.193689	ESTs	0.077
332792			CH22_FGENES.3_2	0.078
330513	M81057	Hs.180884	carboxypeptidase B1 (tissue)	0.078
308905	AI859636	Hs.8102	ribosomal protein S20	0.078
337419			CH22_FGENES.759-4	0.078
333459			CH22_FGENES.157_8	0.078
334851			CH22_FGENES.440_3	0.078
329046			CH.X_hs gi|5868569	0.078
327879			CH.06_hs gi|5868142	0.079
305830	AA857665		EST singleton (not in UniGene) with exon hit	0.079
302928	AL137719		EST cluster (not in UniGene) with exon hit	0.079
304321	AA136698	Hs.113029	ribosomal protein S25	0.079
326390			CH.19_hs gi|5867340	0.079
335230			CH22_FGENES.514_2	0.08
334622			CH22_FGENES.412_6	0.08
335331			CH22_FGENES.535_4	0.08
304753	AA578840	Hs.77961	major histocompatibility complex; class I; B	0.08
301863	AI418863		EST cluster (not in UniGene) with exon hit	0.081
336561			CH22_FGENES.842_6	0.081
335611			CH22_FGENES.583_5	0.081
305060	AA635771		EST singleton (not in UniGene) with exon hit	0.081
306051	AA905130		EST singleton (not in UniGene) with exon hit	0.082
308289	AI571211		EST singleton (not in UniGene) with exon hit	0.082
334365			CH22_FGENES.378_13	0.082
335496			CH22_FGENES.571_4	0.082
332634	S38953		Human unidentified gene complementary to P450c21 gene; partial cds	0.082
337824			CH22_EM:AC005500.GENSCAN.13-18	0.082
335822			CH22_FGENES.619_7	0.082
334758			CH22_FGENES.428_7	0.082
309641	AW194230	Hs.253100	EST	0.082
333064			CH22_FGENES.75_7	0.083
338695			CH22_EM:AC005500.GENSCAN.477-25	0.083
331809	AA402482	Hs.97312	ESTs	0.083
326138			CH.17_hs gi|5867203	0.083
328304			CH.07_hs gi|6004478	0.083
330570	U60276	Hs.165439	arsA (bacterial) arsenite transporter; ATP-binding; homolog 1	0.083
334305			CH22_FGENES.373_8	0.083
335885			CH22_FGENES.632_3	0.083
325839			CH.16_hs gi|6552452	0.083
333531			CH22_FGENES.175_18	0.084
330385	AA449749	Hs.31386	ESTs; Highly similar to secreted apoptosis related protein 1 [H.sapiens]	0.084
323305	AA811351	Hs.25307	Homo sapiens clone 24812 mRNA sequence	0.084
331698	Z39929	Hs.65843	ESTs	0.084

335888			CH22_FGENES.633_2	0.084
306008	AA894390		EST singleton (not in UniGene) with exon hit	0.084
334249			CH22_FGENES.365_15	0.084
318303	AW451197	Hs.113418	ESTs	0.084
330171			CH.02_p2 gi|6648220	0.084
336662			CH22_FGENES.41-1	0.085
320506	AI815668	Hs.157476	suc1-associated neurotrophic factor target 2 (FGFR signalling adaptor)	0.085
316974	AI740721	Hs.128292	ESTs	0.085
336492			CH22_FGENES.832_9	0.085
335750			CH22_FGENES.602_4	0.085
335676			CH22_FGENES.594_1	0.086
336093			CH22_FGENES.691_2	0.086
310932	AI933861	Hs.222852	ESTs	0.086
335160			CH22_FGENES.502_4	0.086
334306			CH22_FGENES.373_9	0.086
334793			CH22_FGENES.433_5	0.086
333936			CH22_FGENES.301_2	0.087
336413			CH22_FGENES.823_35	0.087
333775			CH22_FGENES.272_6	0.087
335971			CH22_FGENES.652_4	0.087
301737	AI815981		EST cluster (not in UniGene) with exon hit	0.087
339101			CH22_DA59H18.GENSCAN.44-6	0.087
327612			CH.04_hs gi|6525283	0.087
326241			CH.17_hs gi|5867260	0.088
338386			CH22_EM:AC005500.GENSCAN.331-4	0.088
327762			CH.05_hs gi|5867961	0.088
305266	AA679772		EST singleton (not in UniGene) with exon hit	0.088
334359			CH22_FGENES.378_4	0.088
335500			CH22_FGENES.571_10	0.088
329687			CH.14_p2 gi|6117856	0.088
333654			CH22_FGENES.240_2	0.088
324430	AA464018		EST cluster (not in UniGene)	0.088
325999			CH.16_hs gi|5867073	0.089
334832			CH22_FGENES.439_1	0.089
339115			CH22_DA59H18.GENSCAN.49-3	0.089
300896	AI916902	Hs.213882	ESTs	0.089
328784			CH.07_hs gi|5868309	0.089
335044			CH22_FGENES.480_1	0.089
329791			CH.14_p2 gi|6469354	0.089
333656			CH22_FGENES.240_4	0.089
326180			CH.17_hs gi|5867211	0.089
333391			CH22_FGENES.144_6	0.089
338324			CH22_EM:AC005500.GENSCAN.306-3	0.089
305396	AA721052		EST singleton (not in UniGene) with exon hit	0.089
337483			CH22_FGENES.795-7	0.09
326424			CH.19_hs gi|5867369	0.09
306454	AA977992		EST singleton (not in UniGene) with exon hit	0.09
338893			CH22_DJ32I10.GENSCAN.7-6	0.09
327470			CH.02_hs gi|5867772	0.09
333165			CH22_FGENES.91_7	0.09
307155	AI186738	Hs.182426	ribosomal protein S2	0.09
330717	AA233926	Hs.23635	ESTs	0.09
335334			CH22_FGENES.535_10	0.09
335907			CH22_FGENES.636_2	0.09
333885			CH22_FGENES.292_7	0.09
331034	N51868	Hs.31965	ESTs; Moderately similar to 40S RIBOSOMAL PROTEIN S20 [H.sapiens]	0.09
304660	AA534416	Hs.162185	ESTs	0.09
328217			CH.06_hs gi|5868096	0.091
336068			CH22_FGENES.684_13	0.091
302833	AA295381	Hs.44423	ESTs	0.091
328668			CH.07_hs gi|5868254	0.091
335309			CH22_FGENES.532_2	0.091
338481			CH22_EM:AC005500.GENSCAN.377-5	0.091
306286	AA936892		EST singleton (not in UniGene) with exon hit	0.091
305070	AA639783		EST singleton (not in UniGene) with exon hit	0.091
304870	AA594811	Hs.119122	ribosomal protein L13a	0.091
303856	AA968589	Hs.944	glucose phosphate isomerase	0.091

323789	AI459812	Hs.170460	ESTs; Weakly similar to KIAA0990 protein [H.sapiens]	0.092
334910			CH22_FGENES.455_3	0.092
326382			CH.19_hs gi|5867327	0.092
332467	AA489630	Hs.119004	KIAA0665 gene product	0.092
338534			CH22_EM:AC005500.GENSCAN.402-7	0.092
336449			CH22_FGENES.829_6	0.092
333709			CH22_FGENES.250_24	0.092
336559			CH22_FGENES.842_4	0.092
333230			CH22_FGENES.107_10	0.093
333133			CH22_FGENES.83_9	0.093
334885			CH22_FGENES.451_11	0.093
330605	X02419	Hs.77274	plasminogen activator; urokinase	0.093
336392			CH22_FGENES.823_4	0.093
334083			CH22_FGENES.327_38	0.093
325469			CH.12_hs gi|6017034	0.093
331077	R09531	Hs.19039	ESTs	0.093
303701	AW500732		EST cluster (not in UniGene) with exon hit	0.093
334218			CH22_FGENES.358_3	0.093
336542			CH22_FGENES.840_6	0.093
337151			CH22_FGENES.546-1	0.093
333642			CH22_FGENES.231_2	0.093
336863			CH22_FGENES.297-4	0.093
334680			CH22_FGENES.419_2	0.093
326365			CH.18_hs gi|5867297	0.093
338952			CH22_DJ32I10.GENSCAN.23-22	0.093
337539			CH22_FGENES.832-4	0.094
333546			CH22_FGENES.180_2	0.094
335258			CH22_FGENES.518_3	0.094
336788			CH22_FGENES.168-19	0.094
321644	AI204177	Hs.237396	ESTs	0.094
335943			CH22_FGENES.646_17	0.094
327918			CH.06_hs gi|5868165	0.094
306398	AA970548		EST singleton (not in UniGene) with exon hit	0.094
335671			CH22_FGENES.592_3	0.094
335033			CH22_FGENES.475_11	0.094
338277			CH22_EM:AC005500.GENSCAN.290-2	0.094
332061	AA504812	Hs.192824	early B-cell factor	0.094
305153	AA654582	Hs.77039	ribosomal protein S3A	0.094
333880			CH22_FGENES.292_2	0.094
323940	AI864428	Hs.170880	ESTs	0.094
313779	AA648796	Hs.129771	ESTs	0.095
323109	AA169345		EST cluster (not in UniGene)	0.095
332930			CH22_FGENES.38_4	0.095
335368			CH22_FGENES.543_6	0.095
303887	R72672	Hs.193484	ESTs; Weakly similar to Similarity with yeast gene L3502.1 [C.elegans]	0.095
336223			CH22_FGENES.727_3	0.095
311280	AI767957	Hs.197737	ESTs; Weakly similar to Y38A8.1 gene product [C.elegans]	0.095
337256			CH22_FGENES.648-3	0.095
308814	AI819263		EST singleton (not in UniGene) with exon hit	0.095
334659			CH22_FGENES.418_7	0.095
335895			CH22_FGENES.635_3	0.095
321697	AW388061	Hs.4953	golgi autoantigen; golgin subfamily a; 3	0.095
336010			CH22_FGENES.668_8	0.096
302824	U21260		EST cluster (not in UniGene) with exon hit	0.096
333612			CH22_FGENES.217_7	0.096
304823	AA584837		EST singleton (not in UniGene) with exon hit	0.096
335665			CH22_FGENES.590_16	0.096
306518	AA989598		EST singleton (not in UniGene) with exon hit	0.096
335243			CH22_FGENES.516_4	0.096
335436			CH22_FGENES.559_5	0.096
300243	AI420256	Hs.161271	ESTs	0.096
332810			CH22_FGENES.7_12	0.097
308612	AI735634		EST singleton (not in UniGene) with exon hit	0.097
335818			CH22_FGENES.618_6	0.097
325838			CH.16_hs gi|6552452	0.097
337482			CH22_FGENES.795-6	0.097
336645			CH22_FGENES.26-1	0.097
337293			CH22_FGENES.675-1	0.098

329893			CH.15_p2 gi|6525313	0.098
326533			CH.19_hs gi|5867441	0.098
334905			CH22_FGENES.452_20	0.098
306347	AA961144		EST singleton (not in UniGene) with exon hit	0.098
336676			CH22_FGENES.43-4	0.098
339166			CH22_DA59H18.GENSCAN.69-7	0.098
335774			CH22_FGENES.607_10	0.098
339216			CH22_FF113D11.GENSCAN.6-11	0.098
335311			CH22_FGENES.532_4	0.098
329632			CH.11_p2 gi|6729060	0.098
328595			CH.07_hs gi|5868224	0.098
326928			CH.21_hs gi|6456782	0.098
315234	AI079680	Hs.120770	ESTs	0.098
306082	AA908508		EST singleton (not in UniGene) with exon hit	0.098
305710	AA826544		EST singleton (not in UniGene) with exon hit	0.098
318540	T30280		EST cluster (not in UniGene)	0.099
337553			CH22_C4G1.GENSCAN.2-1	0.099
320951	AA344069	Hs.202699	neurexophilin 4	0.099
303845	T08033		EST cluster (not in UniGene) with exon hit	0.099
338981			CH22_DA59H18.GENSCAN.2-5	0.099
321313	R87365	Hs.26058	ESTs; Weakly similar to p532 [H.sapiens]	0.099
328348			CH.07_hs gi|5868383	0.099
332203	H49388	Hs.102082	EST	0.099
301780	R07064		EST cluster (not in UniGene) with exon hit	0.099
332095	AA608838	Hs.162681	EST	0.099
333227			CH22_FGENES.107_5	0.099
316442	AA760894	Hs.153023	ESTs	0.099
326001			CH.16_hs gi|5867073	0.099
334363			CH22_FGENES.378_11	0.099
338895			CH22_DJ32I10.GENSCAN.9-2	0.099
327460			CH.02_hs gi|6004455	0.099
332705	T59161	Hs.76293	thymosin; beta 10	0.1
307806	AI351739		EST singleton (not in UniGene) with exon hit	0.1
322800	F25037	Hs.225175	ESTs	0.1
304918	AA602697		EST singleton (not in UniGene) with exon hit	0.1
334327			CH22_FGENES.375_4	0.1
318359	AI097439	Hs.135548	ESTs	0.1
326644			CH.20_hs gi|5867559	0.1
334454			CH22_FGENES.388_3	0.1
327959			CH.06_hs gi|5868210	0.1
323783	AA330586	Hs.131819	ESTs	0.1
309198	AI955915	Hs.248038	major histocompatibility complex; class I; C	0.1
339265			CH22_BA354I12.GENSCAN.10-3	0.1
320576	AL049977	Hs.162209	Homo sapiens mRNA; cDNA DKFZp564C122 (from clone DKFZp564C122)	0.1
338132			CH22_EM:AC005500.GENSCAN.200-2	0.1
333163			CH22_FGENES.91_5	0.101
337584			CH22_C20H12.GENSCAN.5-1	0.101
307588	AI285535		EST singleton (not in UniGene) with exon hit	0.101
336969			CH22_FGENES.378-2	0.101
327535			CH.02_hs gi|6525279	0.101
328732			CH.07_hs gi|5868289	0.101
336686			CH22_FGENES.46-3	0.101
335777			CH22_FGENES.607_13	0.101
332944			CH22_FGENES.47_3	0.101
333174			CH22_FGENES.95_1	0.101
336380			CH22_FGENES.821_8	0.101
330571	U60800	Hs.79089	sema domain; immunoglobulin domain (Ig); cytoplasmic domain; (semaphorin) 4D	0.101
331789	AA398721	Hs.186749	ESTs	0.101
338915			CH22_DJ32I10.GENSCAN.12-1	0.101
334844			CH22_FGENES.439_24	0.101
336642			CH22_FGENES.23-4	0.101
334906			CH22_FGENES.452_21	0.101
333188			CH22_FGENES.98_8	0.101
300088	AW299993		EST cluster (not in UniGene) with exon hit	0.101
329373			CH.X_hs gi|6682537	0.102
331120	R46576	Hs.23239	ESTs	0.102
335856			CH22_FGENES.628_1	0.102

331888	AA431337	Hs.98017	ESTs	0.102
333154			CH22_FGENES.89_4	0.102
335989			CH22_FGENES.655_2	0.102
304385	AA235602		EST singleton (not in UniGene) with exon hit	0.102
338016			CH22_EM:AC005500.GENSCAN.133-1	0.102
335190			CH22_FGENES.507_5	0.102
318595	T39486	Hs.6137	ESTs	0.102
333697			CH22_FGENES.250_11	0.102
306526	AA989713		EST singleton (not in UniGene) with exon hit	0.103
328734			CH.07_hs gi|5868289	0.103
307294	AI205612	Hs.73742	ribosomal protein; large; P0	0.103
327424			CH.02_hs gi|5867751	0.103
335872			CH22_FGENES.630_3	0.103
333572			CH22_FGENES.189_1	0.103
334774			CH22_FGENES.430_6	0.103
338660			CH22_EM:AC005500.GENSCAN.462-1	0.103
326713			CH.20_hs gi|5867595	0.103
333994			CH22_FGENES.310_18	0.103
335800			CH22_FGENES.613_4	0.103
318113	AI187943	Hs.132322	ESTs	0.103
337278			CH22_FGENES.665-1	0.103
336386			CH22_FGENES.822_6	0.103
334790			CH22_FGENES.432_15	0.103
303778	AW505368		EST cluster (not in UniGene) with exon hit	0.104
336524			CH22_FGENES.839_5	0.104
328936			CH.08_hs gi|5868500	0.104
335102			CH22_FGENES.494_7	0.104
300935	AA513644	Hs.222815	ESTs; Weakly similar to Wiskott-Aldrich Syndrome protein [H.sapiens]	0.104
307581	AI284415		EST singleton (not in UniGene) with exon hit	0.104
317301	AW291683	Hs.226056	ESTs	0.104
335330			CH22_FGENES.535_3	0.104
337968			CH22_EM:AC005500.GENSCAN.103-2	0.104
335627			CH22_FGENES.584_7	0.104
336274			CH22_FGENES.762_2	0.104
334730			CH22_FGENES.424_5	0.105
334409			CH22_FGENES.383_6	0.105
327237			CH.01_hs gi|5867544	0.105
333321			CH22_FGENES.138_13	0.105
303181	AA452366		EST cluster (not in UniGene) with exon hit	0.105
333738			CH22_FGENES.261_2	0.105
338255			CH22_EM:AC005500.GENSCAN.276-3	0.105
334282			CH22_FGENES.369_12	0.105
330190			CH.05_p2 gi|6165182	0.105
310748	AW014249	Hs.158698	ESTs	0.105
338150			CH22_EM:AC005500.GENSCAN.207-2	0.105
336719			CH22_FGENES.82-6	0.105
330228			CH.05_p2 gi|6013527	0.105
327801			CH.05_hs gi|5867924	0.105
330525	S75168	Hs.274	megakaryocyte-associated tyrosine kinase	0.105
334972			CH22_FGENES.468_2	0.105
335111			CH22_FGENES.494_19	0.106
334483			CH22_FGENES.395_5	0.106
328829			CH.07_hs gi|5868337	0.106
302753	M74299		EST cluster (not in UniGene) with exon hit	0.106
334512			CH22_FGENES.398_10	0.106
330024			CH.16_p2 gi|6671908	0.106
321030	AI769930	Hs.233617	Homo sapiens (clone B3B3E13) Huntington's disease candidate region	0.107
338410			CH22_EM:AC005500.GENSCAN.341-6	0.107
334353			CH22_FGENES.376_5	0.107
338276			CH22_EM:AC005500.GENSCAN.288-9	0.107
329053			CH.X_hs gi|5868574	0.107
336560			CH22_FGENES.842_5	0.107
332158	AA621363	Hs.112980	EST	0.107
336447			CH22_FGENES.829_4	0.107
333703			CH22_FGENES.250_17	0.107
326207			CH.17_hs gi|5867222	0.107
333232			CH22_FGENES.108_1	0.107

334802			CH22_FGENES.435_1	0.107
303784	AA704983		EST cluster (not in UniGene) with exon hit	0.107
338847			CH22_DJ246D7.GENSCAN.10-2	0.107
339407			CH22_DJ579N16.GENSCAN.1-9	0.108
337635			CH22_C20H12.GENSCAN.32-8	0.108
334650			CH22_FGENES.417_17	0.108
308511	AI687580		EST singleton (not in UniGene) with exon hit	0.108
333392			CH22_FGENES.144_8	0.108
325840			CH.16_hs gi|6552452	0.108
315044	AW205664	Hs.129568	ESTs	0.108
333298			CH22_FGENES.133_4	0.108
335157			CH22_FGENES.501_7	0.108
333305			CH22_FGENES.137_2	0.108
326379			CH.19_hs gi|5867327	0.108
335050			CH22_FGENES.482_1	0.108
305185	AA663985	Hs.248038	major histocompatibility complex; class I; C	0.108
335658			CH22_FGENES.590_9	0.108
323040	AA338609	Hs.10862	ESTs	0.108
337326			CH22_FGENES.699-6	0.108
339262			CH22_BA354I12.GENSCAN.9-6	0.108
321202	H54052	Hs.163639	ESTs; Weakly similar to INTERCELLULAR ADHESION MOLECULE-1 PRECURSOR [H.sapiens]	0.109
331792	AA398968	Hs.97548	EST	0.109
333806			CH22_FGENES.278_2	0.109
321325	AB033100		EST cluster (not in UniGene)	0.109
331373	AA435513	Hs.178170	ESTs; Weakly similar to DUAL SPECIFICITY PROTEIN PHOSPHATASE 3	0.87
328775			CH.07_hs gi|5868309	0.109
335105			CH22_FGENES.494_10	0.109
300975	AI283548	Hs.149668	ESTs	0.109
324893	T31940		EST cluster (not in UniGene)	0.109
333397			CH22_FGENES.144_15	0.109
336484			CH22_FGENES.831_3	0.109
335507			CH22_FGENES.571_22	0.109
336373			CH22_FGENES.820_3	0.109
336188			CH22_FGENES.717_12	0.109
313455	AW081702	Hs.137329	ESTs	0.109
335185			CH22_FGENES.506_4	0.109
306814	AI066577		EST singleton (not in UniGene) with exon hit	0.109
311130	AI632322	Hs.195306	ESTs	0.109
310882	AW080339	Hs.211911	ESTs	0.109
323383	AI346359	Hs.135209	ESTs	0.11
300212	AW135925	Hs.184552	biphenylhydrolase-like (serine hydrolase; breast epithelial mucin-assoc.	0.11
325675			CH.14_hs gi|5867014	0.11
330095			CH.19_p2 gi|6015278	0.11
331942	AA453261	Hs.99309	ESTs	0.11
334723			CH22_FGENES.421_34	0.11
333614			CH22_FGENES.217_9	0.11
337316			CH22_FGENES.692-1	0.11
305057	AA635626	Hs.62954	ferritin; heavy polypeptide 1	0.11
338704			CH22_EM:AC005500.GENSCAN.480-3	0.11
335385			CH22_FGENES.543_27	0.11
338012			CH22_EM:AC005500.GENSCAN.128-10	0.11
329449			CH.Y_hs gi|5868886	0.11
338980			CH22_DA59H18.GENSCAN.2-4	0.11
336553			CH22_FGENES.841_10	0.111
330021			CH.16_p2 gi|6671889	0.111
327579			CH.03_hs gi|5867824	0.111
333099			CH22_FGENES.79_4	0.111
337076			CH22_FGENES.453-4	0.111
331388	AA456852	Hs.43543	suppressor of white apricot homolog 2	0.111
306674	AI005542	Hs.180414	heat shock 70kD protein 10 (HSC71)	0.111
305949	AA884409		EST singleton (not in UniGene) with exon hit	0.111
330748	AA419217	Hs.15911	DKFZP586E1422 protein	0.111
333780			CH22_FGENES.273_2	0.111
323676	AI702835		EST cluster (not in UniGene)	0.111
308952	AI868157	Hs.224226	EST	0.111
309338	AW026946	Hs.181165	eukaryotic translation elongation factor 1 alpha 1	0.111

329317			CH.X_hs gi|6381976	0.112
333518			CH22_FGENES.173_3	0.112
306982	AI127883		EST singleton (not in UniGene) with exon hit	0.112
336225			CH22_FGENES.728_2	0.112
333698			CH22_FGENES.250_12	0.112
302173	AI417947	Hs.14068	ESTs	0.112
335510			CH22_FGENES.571_25	0.112
328042			CH.06_hs gi|5902482	0.112
336512			CH22_FGENES.834_7	0.112
328541			CH.07_hs gi|5868486	0.112
311265	AW205118	Hs.199214	ESTs	0.112
323218	AF131846	Hs.13396	Homo sapiens clone 25028 mRNA sequence	0.112
302002	AF013956	Hs.123085	chromobox homolog 4 (Drosophila Pc class)	0.112
315088	AA557351	Hs.152448	ESTs; Moderately similar to MULTIFUNCTIONAL PROTEIN ADE2	0.112
312581	AI937242	Hs.176590	ESTs	0.112
322246	AW384710	Hs.125258	ESTs	0.112
333659			CH22_FGENES.241_5	0.113
327510			CH.02_hs gi|6117815	0.113
336520			CH22_FGENES.839_1	0.113
338682			CH22_EM:AC005500.GENSCAN.472-1	0.113
334508			CH22_FGENES.398_6	0.113
322533	T59538		EST cluster (not in UniGene)	0.113
306873	AI086929		EST singleton (not in UniGene) with exon hit	0.113
336040			CH22_FGENES.679_2	0.113
303898	T23215		EST cluster (not in UniGene) with exon hit	0.113
312011	AW294868	Hs.187226	ESTs	0.113
335186			CH22_FGENES.506_5	0.113
333607			CH22_FGENES.216_2	0.113
305549	AA773530		EST singleton (not in UniGene) with exon hit	0.113
333686			CH22_FGENES.249_4	0.113
334352			CH22_FGENES.376_3	0.113
338195			CH22_EM:AC005500.GENSCAN.233-18	0.114
333588			CH22_FGENES.206_2	0.114
339233			CH22_BA354I12.GENSCAN.2-3	0.114
337455			CH22_FGENES.777-1	0.114
309101	AI925108		EST singleton (not in UniGene) with exon hit	0.114
328522			CH.07_hs gi|5868477	0.114
323999	AI537333	Hs.252782	ESTs	0.114
333517			CH22_FGENES.173_2	0.114
329935			CH.16_p2 gi|6165200	0.114
326226			CH.17_hs gi|5867230	0.114
335890			CH22_FGENES.633_4	0.114
336715			CH22_FGENES.77-1	0.114
327640			CH.04_hs gi|5867890	0.114
338842			CH22_DJ246D7.GENSCAN.7-1	0.114
306534	AA991487		EST singleton (not in UniGene) with exon hit	0.114
336597			CH22_FGENES.266_1	0.114
321010	Y17456	Hs.227150	Homo sapiens LSFR2 gene; last exon	0.114
302294	AA159213	Hs.5337	isocitrate dehydrogenase 2 (NADP+); mitochondrial	0.114
324895	N44238	Hs.77515	inositol 1;4;5-triphosphate receptor; type 3	0.114
327358			CH.01_hs gi|6552411	0.114
308792	AI815153	Hs.195188	glyceraldehyde-3-phosphate dehydrogenase	0.115
325886			CH.16_hs gi|5867087	0.115
336850			CH22_FGENES.272-11	0.115
305858	AA863103		EST singleton (not in UniGene) with exon hit	0.115
302569	AC004472		multiple UniGene matches	0.115
336158			CH22_FGENES.707_2	0.115
327866			CH.06_hs gi|5868131	0.115
339157			CH22_DA59H18.GENSCAN.67-3	0.115
339258			CH22_BA354I12.GENSCAN.8-3	0.115
336129			CH22_FGENES.701_17	0.115
333684			CH22_FGENES.249_2	0.115
309618	AW190162	Hs.184776	ribosomal protein L23a	0.115
312926	AA954097	Hs.127523	ESTs	0.115
302640	AB035698		EST cluster (not in UniGene) with exon hit	0.115
328968			CH.08_hs gi|6456775	0.115
327902			CH.06_hs gi|5868158	0.115
321927	AJ223366		EST cluster (not in UniGene)	0.115
335962			CH22_FGENES.651_4	0.115

334927			CH22_FGENES.460_1	0.115
330535	U11872		Human interleukin-8 receptor type B (IL8RB) mRNA, splice variant IL8RB1	0.858
328591			CH.07_hs gi|5868227	0.115
334902			CH22_FGENES.452_16	0.115
328525			CH.07_hs gi|5868482	0.115
325870			CH.16_hs gi|6682492	0.116
337522			CH22_FGENES.819-1	0.116
305079	AA641329		EST singleton (not in UniGene) with exon hit	0.116
327343			CH.01_hs gi|6017017	0.116
333918			CH22_FGENES.296_7	0.116
333600			CH22_FGENES.213_2	0.116
335846			CH22_FGENES.623_6	0.116
333510			CH22_FGENES.171_4	0.116
327629			CH.04_hs gi|5867872	0.116
333470			CH22_FGENES.161_6	0.116
326855			CH.20_hs gi|6552460	0.116
327008			CH.21_hs gi|5867664	0.117
337480			CH22_FGENES.795-3	0.117
338425			CH22_FGENES.824_10	0.117
321984	AL079687	Hs.171065	ESTs	0.117
335651			CH22_FGENES.590_2	0.117
308164	AI521574	Hs.181165	eukaryotic translation elongation factor 1 alpha 1	0.117
337927			CH22_EM:AC005500.GENSCAN.80-3	0.117
300341	H45095	Hs.153524	ESTs	0.117
300154	AI245127	Hs.179331	ESTs	0.117
306295	AA937331		EST singleton (not in UniGene) with exon hit	0.117
329670			CH.14_p2 gi|6272129	0.117
335612			CH22_FGENES.583_6	0.117
307845	AI363450		EST singleton (not in UniGene) with exon hit	0.117
330401	D28383		Human mRNA for ATP synthase B chain, 5'UTR (sequence from the 5'cap to the start codon)	0.117
327127			CH.21_hs gi|6682520	0.117
333843			CH22_FGENES.290_1	0.117
331083	R17762	Hs.22292	ESTs	0.117
329140			CH.X_hs gi|6017060	0.117
339338			CH22_BA354I12.GENSCAN.27-3	0.117
331974	AA464518	Hs.99616	ESTs	0.117
338631			CH22_EM:AC005500.GENSCAN.454-2	0.117
330299			CH.06_p2 gi|2905881	0.117
330351			CH.09_p2 gi|3056622	0.117
305377	AA715714	Hs.181357	laminin receptor 1 (67kD; ribosomal protein SA)	0.117
333106			CH22_FGENES.79_12	0.117
338514			CH22_EM:AC005500.GENSCAN.392-4	0.117
327335			CH.01_hs gi|5902477	0.117
301970	AB028962	Hs.120245	KIAA1039 protein	0.118
326339			CH.17_hs gi|6056311	0.118
330612	X15673	Hs.93174	Human endogenous retrovirus pHE.1 (ERV9)	0.118
334178			CH22_FGENES.350_6	0.118
328008			CH.06_hs gi|5902482	0.118
329976			CH.16_p2 gi|4878063	0.118
320952	AA897432	Hs.130411	ESTs	0.118
305621	AA789095		EST singleton (not in UniGene) with exon hit	0.118
337850			CH22_EM:AC005500.GENSCAN.34-3	0.118
333626			CH22_FGENES.224_2	0.118
337672			CH22_EM:AC000097.GENSCAN.67-1	0.118
328803			CH.07_hs gi|6004475	0.118
325922			CH.16_hs gi|5867122	0.118
334489			CH22_FGENES.397_1	0.118
320638	R54766	Hs.101120	ESTs	0.118
321932	AA569229		EST cluster (not in UniGene)	0.118
336958			CH22_FGENES.387-1	0.118
332082	AA600176	Hs.112345	ESTs	0.118
306004	AA889992		EST singleton (not in UniGene) with exon hit	0.118
336803			CH22_FGENES.194-1	0.118
309107	AI925823		EST singleton (not in UniGene) with exon hit	0.118
336859			CH22_FGENES.293-9	0.118
337935			CH22_EM:AC005500.GENSCAN.85-6	0.118
326492			CH.19_hs gi|5867422	0.118

327289			CH.01_hs gi|5867481	0.119
325818			CH.14_hs gi|6682490	0.119
310787	AW262580	Hs.159040	ESTs	0.119
330028			CH.16_p2 gi|6671908	0.119
325317			CH.11_hs gi|5866878	0.119
335279			CH22_FGENES.523_7	0.119
331720	AA192173	Hs.221530	ESTs	0.119
329186			CH.X_hs gi|5868711	0.119
316012	AA764950	Hs.119898	ESTs	0.119
338316			CH22_EM:AC005500.GENSCAN.304-2	0.119
326033			CH.17_hs gi|5867178	0.119
334745			CH22_FGENES.426_3	0.119
333051			CH22_FGENES.73_5	0.119
301763	R01279		EST cluster (not in UniGene) with exon hit	0.12
304502	AA454809	Hs.172928	collagen; type I; alpha 1	0.12
335680			CH22_FGENES.594_5	0.12
304678	AA548556		EST singleton (not in UniGene) with exon hit	0.12
335441			CH22_FGENES.560_4	0.12
336187			CH22_FGENES.717_11	0.12
309422	AW087175		EST singleton (not in UniGene) with exon hit	0.12
336047			CH22_FGENES.679_9	0.12
309651	AW195850		EST singleton (not in UniGene) with exon hit	0.12
308547	AI695385	Hs.201903	EST	0.12
304443	AA399444		EST singleton (not in UniGene) with exon hit	0.12
336245			CH22_FGENES.746_3	0.12
302703	H72333		EST cluster (not in UniGene) with exon hit	0.12
335690			CH22_FGENES.596_5	0.12
328941			CH.08_hs gi|6456765	0.12
333873			CH22_FGENES.291_9	0.12
317246	AW105092	Hs.155690	ESTs	0.12
339288			CH22_BA354I12.GENSCAN.16-6	0.12
337996			CH22_EM:AC005500.GENSCAN.116-3	0.12
333304			CH22_FGENES.137_1	0.121
308332	AI591235		EST singleton (not in UniGene) with exon hit	0.121
329319			CH.X_hs gi|6381976	0.121
302086	X57138		multiple UniGene matches	0.121
333290			CH22_FGENES.129_2	0.121
323825	AI793080	Hs.123525	ESTs; Weakly similar to NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN PRECURSOR [R.norvegicus]	0.121
330575	U64105	Hs.252280	Rho guanine nucleotide exchange factor (GEF) 1	0.121
305274	AA679990	Hs.181165	eukaryotic translation elongation factor 1 alpha 1	0.121
333647			CH22_FGENES.235_2	0.121
302251	AA333340		EST cluster (not in UniGene) with exon hit	0.121
329777			CH.14_p2 gi|6002090	0.121
333155			CH22_FGENES.89_5	0.121
326122			CH.17_hs gi|5867194	0.121
335310			CH22_FGENES.532_3	0.121
335453			CH22_FGENES.562_13	0.122
305103	AA643329	Hs.111334	ferritin; light polypeptide	0.122
337284			CH22_FGENES.667-2	0.122
337418			CH22_FGENES.758-4	0.122
313073	AI963740	Hs.46826	ESTs	0.122
303759	AW504164		EST cluster (not in UniGene) with exon hit	0.122
300017	M33197		AFFX control: GAPDH	0.122
316725	AW135084	Hs.127264	ESTs	0.122
330738	AA293153	Hs.120980	nuclear receptor co-repressor 2	0.122
336466			CH22_FGENES.829_25	0.122
335956			CH22_FGENES.647_3	0.122
315308	AA780564	Hs.189053	ESTs	0.122
338925			CH22_DJ32I10.GENSCAN.14-3	0.122
334969			CH22_FGENES.466_2	0.122
322050	AL137589		EST cluster (not in UniGene)	0.122
339084			CH22_DA59H18.GENSCAN.38-2	0.122
338323			CH22_EM:AC005500.GENSCAN.306-2	0.122
337003			CH22_FGENES.419-7	0.122
325470			CH.12_hs gi|6017034	0.123
336503			CH22_FGENES.833_10	0.123
330786	D60374	Hs.258712	EST	0.123

329446			CH.Y_hs gi|5868886	0.123
303326	AA229433	Hs.222634	ESTs; Moderately similar to ubiquitin-like protein / ribosomal protein S30	0.123
309067	AI916313	Hs.212788	EST	0.123
317464	AA968472	Hs.130463	ESTs	0.123
328755			CH.07_hs gi|5868301	0.123
326036			CH.17_hs gi|5867178	0.123
327208			CH.01_hs gi|5867447	0.123
326124			CH.17_hs gi|5916395	0.123
327509			CH.02_hs gi|6117815	0.123
338398			CH22_EM:AC005500.GENSCAN.336-5	0.123
304652	AA527782	Hs.84298	CD74 antigen (invariant polypeptide of major histocompatibility complex; class II antigen-associated)	0.123
335797			CH22_FGENES.612_6	0.124
336714			CH22_FGENES.76-29	0.124
327204			CH.01_hs gi|5867447	0.124
331881	AA430672	Hs.123778	ESTs	0.124
306971	AI126509		EST singleton (not in UniGene) with exon hit	0.124
336174			CH22_FGENES.710_1	0.124
336126			CH22_FGENES.701_13	0.124
329129			CH.X_hs gi|6588026	0.124
303049	AW407562		EST cluster (not in UniGene) with exon hit	0.124
335778			CH22_FGENES.607_14	0.124
336601			CH22_FGENES.369_2	0.124
334340			CH22_FGENES.375_17	0.124
337436			CH22_FGENES.767-1	0.124
306013	AA896990		EST singleton (not in UniGene) with exon hit	0.124
339213			CH22_FF113D11.GENSCAN.6-8	0.124
335355			CH22_FGENES.541_2	0.124
336552			CH22_FGENES.841_9	0.124
336384			CH22_FGENES.822_4	0.124
310485	AI286202	Hs.149800	ESTs	0.125
335840			CH22_FGENES.622_3	0.125
336444			CH22_FGENES.827_10	0.125
315703	N36070		EST cluster (not in UniGene)	0.125
327763			CH.05_hs gi|5867961	0.125
336383			CH22_FGENES.822_3	0.125
333496			CH22_FGENES.168_6	0.125
328662			CH.07_hs gi|6004473	0.125
338986			CH22_DA59H18.GENSCAN.5-1	0.125
328311			CH.07_hs gi|5868371	0.125
337241			CH22_FGENES.644-2	0.125
336933			CH22_FGENES.350-7	0.125
313483	AW294432	Hs.144252	ESTs	0.125
326116			CH.17_hs gi|5867193	0.125
330450	HG363-HT363		Epidermal Growth Factor Receptor-Related Protein	0.125
307491	AI268539		EST singleton (not in UniGene) with exon hit	0.125
331852	AA418988	Hs.98314	Homo sapiens mRNA; cDNA DKFZp586L0120 (from clone DKFZp586L0120)	0.125
330462	HG944-HT944		Dopamine Receptor D4	0.125
304410	AA284508		EST singleton (not in UniGene) with exon hit	0.125
336385			CH22_FGENES.822_5	0.125
336793			CH22_FGENES.176-3	0.125
326243			CH.17_hs gi|5867261	0.125
327266			CH.01_hs gi|5867462	0.125
320753	AF070579	Hs.181544	Homo sapiens clone 24487 mRNA sequence	0.125
336960			CH22_FGENES.369-5	0.125
329667			CH.14_p2 gi|6272129	0.125
328168			CH.06_hs gi|5868071	0.125
336534			CH22_FGENES.839_16	0.125
339289			CH22_BA354I12.GENSCAN.16-9	0.126
309230	AI970747		EST singleton (not in UniGene) with exon hit	0.126
339190			CH22_FF113D11.GENSCAN.1-2	0.126
337086			CH22_FGENES.458-14	0.126
319233	R21054	Hs.211522	ESTs	0.126
339396			CH22_BA232E17.GENSCAN.6-8	0.126
331930	AA449077	Hs.179765	Homo sapiens mRNA; cDNA DKFZp586H1921 (from clone DKFZp586H192	0.126
308099	AI475914		EST singleton (not in UniGene) with exon hit	0.126

338477			CH22_EM:AC005500.GENSCAN.373-5	0.126
334286			CH22_FGENES.369_16	0.126
317245	AI025039	Hs.131732	ESTs	0.126
335249			CH22_FGENES.516_10	0.126
333327			CH22_FGENES.138_20	0.126
304240	AA009802		EST singleton (not in UniGene) with exon hit	0.126
335464			CH22_FGENES.562_26	0.126
335236			CH22_FGENES.515_8	0.126
334154			CH22_FGENES.340_4	0.126
309257	AI984183		EST singleton (not in UniGene) with exon hit	0.126
310015	AI220122	Hs.201981	ESTs; Weakly similar to breast carcinoma-associated antigen [H.sapiens]	0.126
328280			CH.07_hs gi|5868352	0.126
305744	AA831819		EST singleton (not in UniGene) with exon hit	0.126
327430			CH.02_hs gi|5867754	0.126
328323			CH.07_hs gi|5868373	0.126
333274			CH22_FGENES.123_2	0.126
337193			CH22_FGENES.575-3	0.127
334820			CH22_FGENES.437_2	0.127
328706			CH.07_hs gi|5868270	0.127
331228	W67267	Hs.174911	ESTs	0.127
307205	AI192479		EST singleton (not in UniGene) with exon hit	0.127
337123			CH22_FGENES.519-3	0.127
326201			CH.17_hs gi|5867216	0.127
335276			CH22_FGENES.523_2	0.127
331202	T81115	Hs.191136	ESTs	0.127
330532	U03187	Hs.121544	interleukin 12 receptor; beta 1	0.127
321235	N49521		EST cluster (not in UniGene)	0.127
301743	F12605	Hs.204529	ESTs; Weakly similar to reverse transcriptase [H.sapiens]	0.127
328175			CH.06_hs gi|5868073	0.127
306407	AA971985		EST singleton (not in UniGene) with exon hit	0.127
327145			CH.01_hs gi|5867548	0.127
327649			CH.04_hs gi|5867899	0.127
335142			CH22_FGENES.498_12	0.127
333909			CH22_FGENES.295_2	0.127
330608	X04325	Hs.2679	gap junction protein; beta 1; 32kD (connexin 32; Charcot-Marie-Tooth neuropathy; X-linked)	0.127
330158			CH.21_p2 gi|6580367	0.127
320153	AF064594	Hs.120360	phospholipase A2; group VI	0.127
314407	AA098835	Hs.224432	ESTs	0.127
333383			CH22_FGENES.143_22	0.127
320663	AI734242	Hs.244473	ESTs	0.128
326233			CH.17_hs gi|5867232	0.128
326598			CH.20_hs gi|5867634	0.128
335174			CH22_FGENES.504_4	0.128
319843	H29920	Hs.99486	ESTs; Weakly similar to aralar1 [H.sapiens]	0.128
335458			CH22_FGENES.562_18	0.128
332997			CH22_FGENES.58_4	0.128
334188			CH22_FGENES.352_3	0.128
329759			CH.14_p2 gi|6048280	0.128
330348			CH.09_p2 gi|4544475	0.128
326958			CH.21_hs gi|6469836	0.128
305263	AA679467		EST singleton (not in UniGene) with exon hit	0.128
337693			CH22_EM:AC000097.GENSCAN.78-14	0.128
326812			CH.20_hs gi|6682504	0.128
333237			CH22_FGENES.108_7	0.128
333699			CH22_FGENES.250_13	0.128
311496	AI768677	Hs.209888	ESTs; Weakly similar to phosphatidylserine synthase-2 [M.musculus]	0.128
336499			CH22_FGENES.833_4	0.128
320087	AF032387	Hs.113265	small nuclear RNA activating complex; polypeptide 4; 190kD	0.128
309989	AI184186	Hs.197813	ESTs	0.128
301490	AW298468	Hs.250461	ESTs	0.128
337011			CH22_FGENES.427-6	0.128
315052	AA876910	Hs.134427	ESTs	0.128
301611	W22172	Hs.59038	ESTs	0.128
336497			CH22_FGENES.833_2	0.129
302068	Y16280	Hs.132049	endothelin type b receptor-like protein 2	0.129
334502			CH22_FGENES.397_18	0.129

304332	AA158884		EST singleton (not in UniGene) with exon hit	0.129
304522	AA465405		EST singleton (not in UniGene) with exon hit	0.129
312407	R46180	Hs.153485	ESTs	0.129
310098	AI685841	Hs.161354	ESTs	0.129
301119	AF142579		EST cluster (not in UniGene) with exon hit	0.129
309268	AI985821	Hs.62954	ferritin; heavy polypeptide 1	0.129
330989	H42142	Hs.226396	DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide 19 (Dbp5; yeast; homolog)	0.129
336949			CH22_FGENES.361-4	0.129
330115			CH.19_p2 gi|6015202	0.129
339212			CH22_FF113D11.GENSCAN.6-7	0.129
326951			CH.21_hs gi|6004446	0.129
305165	AA662939		EST singleton (not in UniGene) with exon hit	0.129
308238	AI559492		EST singleton (not in UniGene) with exon hit	0.129
337140			CH22_FGENES.537-5	0.13
321758	U29112		EST cluster (not in UniGene)	0.13
304619	AA515554	Hs.119598	ribosomal protein L3	0.13
312469	AA745289	Hs.173088	ESTs	0.13
339017			CH22_DA59H18.GENSCAN.20-6	0.13
330116			CH.19_p2 gi|6015202	0.13
333312			CH22_FGENES.138_4	0.13
338004			CH22_EM:AC005500.GENSCAN.121-1	0.13
314141	AA232134	Hs.190028	ESTs	0.13
300509	AI239845	Hs.128494	ESTs; Weakly similar to EG:95B7.2 [D.melanogaster]	0.13
338530			CH22_EM:AC005500.GENSCAN.398-11	0.13
335968			CH22_FGENES.652_1	0.13
314121	AI732100	Hs.187619	ESTs	0.13
337593			CH22_C20H12.GENSCAN.6-8	0.13
332881			CH22_FGENES.33_1	0.13
305836	AA858043		EST singleton (not in UniGene) with exon hit	0.13
339059			CH22_DA59H18.GENSCAN.30-5	0.13
305610	AA782319		EST singleton (not in UniGene) with exon hit	0.13
305852	AA862455		EST singleton (not in UniGene) with exon hit	0.13
327409			CH.02_hs gi|5867750	0.13
312751	AI613089	Hs.164178	ESTs	0.13
308726	AI799268	Hs.209929	EST	0.13
325961			CH.16_hs gi|5867147	0.13
311159	AW025919	Hs.197636	ESTs	0.13
322715	AA057230	Hs.182135	ESTs	0.13
336441			CH22_FGENES.827_7	0.13
336339			CH22_FGENES.814_12	0.13
306911	AI095365		EST singleton (not in UniGene) with exon hit	0.13
333613			CH22_FGENES.217_8	0.13
338489			CH22_EM:AC005500.GENSCAN.384-17	0.131
326904			CH.21_hs gi|5867684	0.131
337337			CH22_FGENES.717-1	0.131
326752			CH.20_hs gi|5867615	0.131
303977	AW512978		EST singleton (not in UniGene) with exon hit	0.131
301373	AA595235		EST cluster (not in UniGene) with exon hit	0.131
338448			CH22_EM:AC005500.GENSCAN.359-22	0.131
333774			CH22_FGENES.272_5	0.131
332986			CH22_FGENES.54_8	0.131
335362			CH22_FGENES.541_12	0.131
335896			CH22_FGENES.635_4	0.131
337825			CH22_EM:AC005500.GENSCAN.13-19	0.131
325257			CH.11_hs gi|5866895	0.131
331188	T50240	Hs.167837	ESTs	0.131
330645	Y08302	Hs.144879	dual specificity phosphatase 9	0.131
331760	AA292721	Hs.154434	ESTs; Weakly similar to unknown [H.sapiens]	0.131
322995	AA513829	Hs.29797	ribosomal protein L10	0.131
335497			CH22_FGENES.571_5	0.131
334824			CH22_FGENES.437_6	0.131
319480	R06933	Hs.184221	ESTs	0.131
334842			CH22_FGENES.439_21	0.131
333335			CH22_FGENES.139_4	0.131
317252	AA905178	Hs.130124	ESTs	0.131
329034			CH.X_hs gi|5868561	0.131
305186	AA664230		EST singleton (not in UniGene) with exon hit	0.131
335755			CH22_FGENES.604_4	0.131

302143	H15270	Hs.189847	putative neuronal cell adhesion molecule	0.131
334939			CH22_FGENES.465_3	0.131
318994	C15110	Hs.17802	ESTs	0.131
334498			CH22_FGENES.397_14	0.131
333413			CH22_FGENES.146_2	0.132
329676			CH.14_p2 gi|6272128	0.132
327277			CH.01_hs gi|5867473	0.132
305022	AA627416		EST singleton (not in UniGene) with exon hit	0.132
336805			CH22_FGENES.196-3	0.132
320121	T93657		EST cluster (not in UniGene)	0.132
334761			CH22_FGENES.428_10	0.132
339400			CH22_BA232E17.GENSCAN.7-6	0.132
330301			CH.06_p2 gi|2905862	0.132
316822	AA827691	Hs.129967	ESTs; Weakly similar to neuronal thread protein AD7c-NTP [H.sapiens]	0.132
328020			CH.06_hs gi|5902482	0.132
325327			CH.11_hs gi|5866875	0.132
321163	AA209530		EST cluster (not in UniGene)	0.132
336393			CH22_FGENES.823_5	0.132
325905			CH.16_hs gi|5867104	0.132
305237	AA676286	Hs.2186	eukaryotic translation elongation factor 1 gamma	0.132
339046			CH22_DA59H18.GENSCAN.28-6	0.132
325375			CH.12_hs gi|5866920	0.132
333961			CH22_FGENES.304_7	0.132
335450			CH22_FGENES.562_8	0.133
302286	R58438		EST cluster (not in UniGene) with exon hit	0.133
335116			CH22_FGENES.496_3	0.133
327333			CH.01_hs gi|5902477	0.133
308070	AI470948		EST singleton (not in UniGene) with exon hit	0.133
308311	AI581855		EST singleton (not in UniGene) with exon hit	0.133
320813	AW360847	Hs.208839	ESTs	0.133
323665	AW248307		EST cluster (not in UniGene)	0.133
328318			CH.07_hs gi|5868373	0.133
320603	R51419		EST cluster (not in UniGene)	0.133
332791			CH22_FGENES.3_1	0.133
314976	AA524725	Hs.162108	ESTs	0.133
303309	AL134164	Hs.224868	ESTs	0.133
320581	R39753	Hs.170187	ESTs	0.133
333944			CH22_FGENES.302_2	0.133
317992	AI733512	Hs.130901	ESTs	0.133
330935	F02383	Hs.26492	beta-1;3-glucuronyltransferase 3 (glucuronosyltransferase I)	0.133
336659			CH22_FGENES.36-5	0.133
338887			CH22_DJ32I10.GENSCAN.6-10	0.133
305273	AA679979	Hs.181165	eukaryotic translation elongation factor 1 alpha 1	0.133
333566			CH22_FGENES.183_2	0.134
316952	AW450033	Hs.163312	ESTs	0.134
333818			CH22_FGENES.283_1	0.134
328687			CH.07_hs gi|5868262	0.134
302879	H11802		EST cluster (not in UniGene) with exon hit	0.134
336557			CH22_FGENES.842_2	0.134
335222			CH22_FGENES.513_5	0.134
338094			CH22_EM:AC005500.GENSCAN.179-3	0.134
337384			CH22_FGENES.745-1	0.134
327360			CH.01_hs gi|6552411	0.134
328132			CH.06_hs gi|5868038	0.134
323604	AI751438	Hs.182827	ESTs; Weakly similar to !!!! ALU SUBFAMILY SQ WARNING ENTRY !!!!	0.134
337591			CH22_C20H12.GENSCAN.6-6	0.134
307018	AI140639		EST singleton (not in UniGene) with exon hit	0.134
326896			CH.21_hs gi|5867680	0.134
333479			CH22_FGENES.163_5	0.134
337915			CH22_EM:AC005500.GENSCAN.61-3	0.134
335110			CH22_FGENES.494_18	0.134
333481			CH22_FGENES.163_9	0.134
327512			CH.02_hs gi|6117815	0.134
300096	AW328639	Hs.83575	ESTs; Weakly similar to ZC328.3 [C.elegans]	0.134
330163			CH.02_p2 gi|6042042	0.135
335752			CH22_FGENES.604_1	0.135
334857			CH22_FGENES.443_1	0.135

301872	H84730		EST cluster (not in UniGene) with exon hit	0.135
337529			CH22_FGENES.823-29	0.135
335734			CH22_FGENES.601_4	0.135
337551			CH22_FGENES.847-8	0.135
309078	AI920965	Hs.77961	major histocompatibility complex; class I; B	0.135
335513			CH22_FGENES.571_28	0.135
339078			CH22_DA59H18.GENSCAN.37-6	0.135
321907	N56660	Hs.148722	ESTs; Weakly similar to large tumor suppressor 1 [H.sapiens]	0.135
337189			CH22_FGENES.571-32	0.135
329635			CH.12_p2 gi|5302817	0.135
308601	AI719930		EST singleton (not in UniGene) with exon hit	0.135
305020	AA627248	Hs.2064	vimentin	0.135
333894			CH22_FGENES.293_1	0.135
322465	AA137152	Hs.3784	ESTs; Highly similar to phosphoserine aminotransferase [H.sapiens]	0.135
305601	AA780975		EST singleton (not in UniGene) with exon hit	0.135
332186	H10781	Hs.141051	ESTs; Moderately similar to !!!! ALU SUBFAMILY SB WARNING ENTRY	0.135
327822			CH.05_hs gi|5867968	0.135
310087	AI393914	Hs.160624	ESTs; Weakly similar to similar to CR16; SH3 domain binding protein	0.135
328752			CH.07_hs gi|5868298	0.135
337611			CH22_C20H12.GENSCAN.19-4	0.135
334470			CH22_FGENES.394_1	0.136
335115			CH22_FGENES.496_2	0.136
328730			CH.07_hs gi|5868289	0.136
330350			CH.09_p2 gi|3056622	0.136
336971			CH22_FGENES.378-6	0.136
308258	AI565612		EST singleton (not in UniGene) with exon hit	0.136
326745			CH.20_hs gi|5867611	0.136
335440			CH22_FGENES.560_3	0.136
320257	AA330746		EST cluster (not in UniGene)	0.136
328677			CH.07_hs gi|5868256	0.136
329731			CH.14_p2 gi|6065783	0.136
315950	AA700553	Hs.206974	ESTs	0.136
330049			CH.17_p2 gi|4567182	0.136
337070			CH22_FGENES.448-3	0.136
304095	H11324	Hs.31059	EST	0.136
309304	AW005527	Hs.232820	EST	0.136
333458			CH22_FGENES.157_7	0.136
329899			CH.15_p2 gi|6563505	0.136
322202	AI275056	Hs.200133	ESTs	0.136
333991			CH22_FGENES.310_15	0.136
318617	AW247252	Hs.75514	nucleoside phosphorylase	0.136
310623	AI341586	Hs.195588	ESTs	0.136
330489	M23323	Hs.3003	CD3E antigen; epsilon polypeptide (TiT3 complex)	0.136
309646	AW194694		EST singleton (not in UniGene) with exon hit	0.136
331068	R00071	Hs.191199	ESTs	0.136
334285			CH22_FGENES.369_15	0.136
332178	F13689	Hs.100725	EST	0.136
305724	AA827608		EST singleton (not in UniGene) with exon hit	0.136
303158	AL138110	Hs.8594	Homo sapiens mRNA containing (CAG)4 repeat; clone CZ-CAG-7	0.136
334543			CH22_FGENES.403_8	0.136
335384			CH22_FGENES.543_26	0.136
336527			CH22_FGENES.839_8	0.136
334951			CH22_FGENES.465_20	0.136
325882			CH.16_hs gi|5867087	0.137
305134	AA653159		EST singleton (not in UniGene) with exon hit	0.137
307058	AI148709		EST singleton (not in UniGene) with exon hit	0.137
331943	AA453418	Hs.178272	ESTs	0.137
331116	R44780	Hs.22634	ESTs	0.137
306094	AA908877		EST singleton (not in UniGene) with exon hit	0.137
333561			CH22_FGENES.180_18	0.137
321439	H61962		EST cluster (not in UniGene)	0.137
324594	AA497090		EST cluster (not in UniGene)	0.137
337926			CH22_EM:AC005500.GENSCAN.77-4	0.137
337353			CH22_FGENES.726-1	0.137
331836	AA412295	Hs.104774	EST	0.137
308981	AI873242		EST singleton (not in UniGene) with exon hit	0.137

329424			CH.Y_hs gi|5868879	0.137
325829			CH.15_hs gi|5867052	0.137
331845	AA416863	Hs.98183	ESTs	0.137
333854			CH22_FGENES.290_13	0.137
306591	AI000248		EST singleton (not in UniGene) with exon hit	0.137
328948			CH.08_hs gi|6456765	0.137
338935			CH22_DJ32I10.GENSCAN.18-12	0.137
325960			CH.16_hs gi|5867147	0.137
328377			CH.07_hs gi|5868390	0.138
308851	AI829820		EST singleton (not in UniGene) with exon hit	0.138
314620	AA424352	Hs.210586	ESTs	0.138
337592			CH22_C20H12.GENSCAN.6-7	0.138
338684			CH22_EM:AC005500.GENSCAN.472-3	0.138
331800	AA400498	Hs.97543	ESTs	0.138
304587	AA505535		EST singleton (not in UniGene) with exon hit	0.138
333981			CH22_FGENES.310_4	0.138
332452	AA040369	Hs.11170	SYT interacting protein	0.138
305752	AA835278		EST singleton (not in UniGene) with exon hit	0.138
311947	T65554	Hs.251591	EST	0.138
333783			CH22_FGENES.273_5	0.138
337406			CH22_FGENES.754-14	0.138
327976			CH.06_hs gi|5868212	0.138
325593			CH.13_hs gi|5866992	0.138
339425			CH22_DJ579N16.GENSCAN.14-4	0.138
304475	AA428879		EST singleton (not in UniGene) with exon hit	0.138
309488	AW131104		EST singleton (not in UniGene) with exon hit	0.138
337532			CH22_FGENES.827-6	0.138
317234	AA904448	Hs.126368	ESTs	0.138
312261	AA854425	Hs.144455	ESTs	0.138
328927			CH.08_hs gi|5868500	0.138
336424			CH22_FGENES.824_9	0.138
326667			CH.20_hs gi|6552455	0.138
325988			CH.16_hs gi|5867064	0.138
318446	AW300287		EST cluster (not in UniGene)	0.139
336511			CH22_FGENES.834_6	0.139
335204			CH22_FGENES.508_13	0.139
303244	AA147472		EST cluster (not in UniGene) with exon hit	0.139
330870	AA115804	Hs.187593	ESTs	0.139
329376			CH.X_hs gi|5868859	0.139
304703	AA563898		EST singleton (not in UniGene) with exon hit	0.139
333653			CH22_FGENES.239_2	0.139
306799	AI051696		EST singleton (not in UniGene) with exon hit	0.139
304872	AA595289		EST singleton (not in UniGene) with exon hit	0.139
330812	AA013001	Hs.60563	ESTs	0.139
329568			CH.10_p2 gi|3962490	0.139
319210	AA253074	Hs.146261	ESTs	0.139
334320			CH22_FGENES.374_5	0.139
300860	AI916949	Hs.149748	ESTs; Weakly similar to weak similarity to collagens [C.elegans]	0.139
305866	AA864533		EST singleton (not in UniGene) with exon hit	0.139
312943	AA984364	Hs.119064	ESTs	0.139
330523	M99439	Hs.83958	transducin-like enhancer of split 4; homolog of Drosophila E(sp1)	0.139
312708	AI076204	Hs.135440	ESTs	0.139
309366	AW072970		EST singleton (not in UniGene) with exon hit	0.139
303273	AA316069		EST cluster (not in UniGene) with exon hit	0.139
317484	AW274696	Hs.143921	ESTs	0.139
333239			CH22_FGENES.111_1	0.139
307126	AI184951		EST singleton (not in UniGene) with exon hit	0.139
316813	AA826505	Hs.124517	ESTs	0.139
331746	AA281365	Hs.121640	ESTs; Weakly similar to KIAA0386 [H.sapiens]	0.139
308558	AI700145	Hs.172182	poly(A)-binding protein; cytoplasmic 1	0.139
310784	AW086142	Hs.159017	ESTs	0.139
323831	AA335715	Hs.200299	ESTs	0.139
307692	AI318342		EST singleton (not in UniGene) with exon hit	0.139
310570	AI318327		EST cluster (not in UniGene)	0.139
327934			CH.06_hs gi|5868184	0.139
305232	AA670052	Hs.195188	glyceraldehyde-3-phosphate dehydrogenase	0.139
334756			CH22_FGENES.428_5	0.139
331938	AA451867	Hs.99255	ESTs	0.139
301393	AI474722	Hs.150898	ESTs; Weakly similar to KIAA0644 protein [H.sapiens]	0.139

312005	T78450	Hs.13941	ESTs	0.139
338431			CH22_EM:AC005500.GENSCAN.351-4	0.14
331214	T90496	Hs.16757	ESTs	0.14
333601			CH22_FGENES.213_4	0.14
323481	AA278449	Hs.137429	ESTs	0.14
336911			CH22_FGENES.344-4	0.14
338157			CH22_EM:AC005500.GENSCAN.209-5	0.14
327845			CH.05_hs gi|6531962	0.14
319109	Z45662	Hs.90797	Homo sapiens clone 23620 mRNA sequence	0.14
334763			CH22_FGENES.428_12	0.14
329384			CH.X_hs gi|5868869	0.14
302996	AF054663		EST cluster (not in UniGene) with exon hit	0.14
323751	AW452656	Hs.209824	ESTs	0.14
329916			CH.16_p2 gi|6223624	0.14
301993	N49826	Hs.18602	ESTs	0.14
338129			CH22_EM:AC005500.GENSCAN.197-2	0.14
325704			CH.14_hs gi|5867028	0.14
335656			CH22_FGENES.590_7	0.14
331673	W72366	Hs.40033	ESTs	0.14
316807	AI018331	Hs.172444	ESTs; Highly similar to transcription regulator [M.musculus]	0.14
310743	AW449754	Hs.158665	ESTs	0.14
326941			CH.21_hs gi|6004446	0.14
328809			CH.07_hs gi|5868327	0.14
323855	AI653164	Hs.128665	ESTs	0.14
304705	AA564064		EST singleton (not in UniGene) with exon hit	0.14
325666			CH.14_hs gi|6469822	0.14
333747			CH22_FGENES.265_6	0.14
318287	AW015616	Hs.143321	ESTs	0.141
332972			CH22_FGENES.51_5	0.141
305704	AA825266		EST singleton (not in UniGene) with exon hit	0.141
315699	AW182805	Hs.189183	ESTs; Weakly similar to Nod1 [H.sapiens]	0.141
327296			CH.01_hs gi|5867492	0.141
336400			CH22_FGENES.823_15	0.141
321033	H26214	Hs.20733	ESTs; Weakly similar to !!!! ALU SUBFAMILY SX WARNING ENTRY	0.141
316522	AI475995	Hs.122910	ESTs	0.141
335715			CH22_FGENES.599_15	0.141
335959			CH22_FGENES.650_2	0.141
333259			CH22_FGENES.118_7	0.141
337382			CH22_FGENES.744-8	0.141
322346	AA227618	Hs.10882	HMG-box containing protein 1	0.141
325378			CH.12_hs gi|5866920	0.141
338500			CH22_EM:AC005500.GENSCAN.390-1	0.141
338460			CH22_EM:AC005500.GENSCAN.362-5	0.141
315279	AW511138	Hs.256581	ESTs	0.141
314439	AI539443	Hs.137447	ESTs	0.141
333624			CH22_FGENES.222_3	0.141
329237			CH.X_hs gi|5868729	0.141
330117			CH.19_p2 gi|6015201	0.141
338017			CH22_EM:AC005500.GENSCAN.134-1	0.141
337854			CH22_EM:AC005500.GENSCAN.38-12	0.142
329984			CH.16_p2 gi|4646193	0.142
305004	AA622328	Hs.162762	EST	0.142
302815	N40373		EST cluster (not in UniGene) with exon hit	0.142
327823			CH.05_hs gi|5867968	0.142
326753			CH.20_hs gi|5867616	0.142
301201	AA904482	Hs.197775	ESTs	0.142
334303			CH22_FGENES.373_6	0.142
326453			CH.19_hs gi|5867399	0.142
311050	AI864581	Hs.215477	ESTs	0.142
308740	AI802711	Hs.210337	EST; Weakly similar to aldolase A [H.sapiens]	0.142
331003	H63959	Hs.142722	ESTs	0.142
338010			CH22_EM:AC005500.GENSCAN.128-8	0.142
336326			CH22_FGENES.812_4	0.142
318100	R44308	Hs.242302	ESTs	0.142
320641	R55421		EST cluster (not in UniGene)	0.142
325855			CH.16_hs gi|5867067	0.142
330425	HG1728-HT1734		Non-Specific Cross Reacting Antigen (Gb:D90277), Alt. Splice Form 2	0.142

324583	AA425411	Hs.22581	ESTs	0.142
326268			CH.17_hs gi|5867267	0.142
331390	AA460341	Hs.45008	ESTs	0.142
338904			CH22_DJ32I10.GENSCAN.10-16	0.143
333096			CH22_FGENES.79_1	0.143
331919	AA446869	Hs.119316	ESTs	0.143
312214	AI248004	Hs.125187	ESTs	0.143
323198	AW179174	Hs.7984	ESTs	0.143
316107	AI204001	Hs.184014	ribosomal protein L31	0.143
301335	AA885317	Hs.190511	ESTs	0.143
337392			CH22_FGENES.747-3	0.143
325543			CH.12_hs gi|6682452	0.143
305903	AA873085		EST singleton (not in UniGene) with exon hit	0.143
332707	L35594	Hs.174185	phosphodiesterase I/nucleotide pyrophosphatase 2 (autotaxin)	0.143
337913			CH22_EM:AC005500.GENSCAN.59-10	0.143
301436	AA961061	Hs.131696	ESTs	0.143
335078			CH22_FGENES.486_5	0.143
338451			CH22_EM:AC005500.GENSCAN.359-39	0.143
302777	AJ230640		EST cluster (not in UniGene) with exon hit	0.143
330464	J03068	Hs.78223	N-acylaminoacyl-peptide hydrolase	0.143
330988	H41411	Hs.33855	ESTs	0.143
328939			CH.08_hs gi|6004481	0.143
308015	AI440174	Hs.228907	EST; Weakly similar to GUANINE NUCLEOTIDE-BINDING PROTEIN BETA SUBUNIT-LIKE PROTEIN 12.3 [H.sapiens]	0.143
328504			CH.07_hs gi|5868471	0.143
332599	AA402891	Hs.32951	solute carrier family 29 (nucleoside transporters); member 2	0.143
335744			CH22_FGENES.601_15	0.143
322394	AF077208		EST cluster (not in UniGene)	0.143
323892	AL042661		EST cluster (not in UniGene)	0.143
318443	AI939323	Hs.157714	ESTs; Weakly similar to NEURONAL ACETYLCHOLINE RECEPTOR PROTEIN; ALPHA-5 CHAIN PRECURSOR [H.sapiens]	0.143
336568			CH22_FGENES.843_7	0.143
330958	H08815	Hs.159824	EST	0.143
327672			CH.04_hs gi|5867843	0.143
335900			CH22_FGENES.635_8	0.144
336044			CH22_FGENES.679_6	0.144
318845	AI815951	Hs.33183	ESTs; Weakly similar to estrogen-responsive finger protein; efp [H.sapiens]	0.144
333483			CH22_FGENES.165_2	0.144
333337			CH22_FGENES.139_6	0.144
305993	AA889197		EST singleton (not in UniGene) with exon hit	0.144
335719			CH22_FGENES.599_22	0.144
325682			CH.14_hs gi|6138923	0.144
327350			CH.01_hs gi|6249563	0.144
339291			CH22_BA354I12.GENSCAN.18-1	0.144
326358			CH.18_hs gi|5867293	0.144
330316			CH.08_p2 gi|6007576	0.144
308150	AI499346	Hs.174131	ribosomal protein L6	0.144
338065			CH22_EM:AC005500.GENSCAN.164-1	0.144
339009			CH22_DA59H18.GENSCAN.18-7	0.144
327776			CH.05_hs gi|5867964	0.145
336664			CH22_FGENES.41-8	0.145
321921	AF070619		EST cluster (not in UniGene)	0.145
319346	T70147	Hs.12024	ESTs	0.145
304265	AA062892		EST singleton (not in UniGene) with exon hit	0.145
303818	Z45986	Hs.250178	copine II	0.145
327498			CH.02_hs gi|6017023	0.145
335227			CH22_FGENES.513_13	0.145
339022			CH22_DA59H18.GENSCAN.22-1	0.145
302597	H55661	Hs.33026	ESTs; Weakly similar to similar to Enterococcus faecalis TRAB [C.elegans]	0.145
308550	AI697008	Hs.201811	EST	0.145
302175	AA262760	Hs.156015	Homo sapiens chromosome 19; cosmid R29381	0.145
303252	AA156760		EST cluster (not in UniGene) with exon hit	0.145
337414			CH22_FGENES.757-2	0.145
310382	AI734009		EST cluster (not in UniGene)	0.145
329333			CH.X_hs gi|5868806	0.145

338857			CH22_FGENES.291-7	0.145
332565	AA234896	Hs.25272	E1A binding protein p300	0.145
318634	AI928098	Hs.156832	ESTs	0.145
336318			CH22_FGENES.801_1	0.145
310960	AI923551	Hs.170843	ESTs	0.145
335346			CH22_FGENES.537_2	0.145
331196	T65416	Hs.12826	ESTs	0.145
337607			CH22_C20H12.GENSCAN.17-3	0.146
331206	T84096	Hs.15284	ESTs	0.146
301793	T80698		EST cluster (not in UniGene) with exon hit	0.146
319590	AA210878		EST cluster (not in UniGene)	0.146
311394	AI695374	Hs.256231	ESTs	0.146
324773	AA632554	Hs.163401	ESTs	0.146
324841	AI142359	Hs.155316	ESTs	0.146
332260	N70088	Hs.138467	ESTs	0.146
329276			CH.X_hs gi|5868762	0.146
335887			CH22_FGENES.633_1	0.146
338294			CH22_EM:AC005500.GENSCAN.297-1	0.146
336993			CH22_FGENES.409-4	0.146
334135			CH22_FGENES.336_2	0.146
326251			CH.17_hs gi|5867263	0.146
337396			CH22_FGENES.749-1	0.146
339167			CH22_DA59H18.GENSCAN.69-8	0.146
316838	AW135418	Hs.161210	ESTs	0.146
325313			CH.11_hs gi|5866865	0.146
331047	N66918	Hs.32205	ESTs	0.146
323915	AL043362		EST cluster (not in UniGene)	0.146
302747	AF062275		EST cluster (not in UniGene) with exon hit	0.146
306317	AA947909		EST singleton (not in UniGene) with exon hit	0.146
334399			CH22_FGENES.382_5	0.146
326472			CH.19_hs gi|5867404	0.146
333061			CH22_FGENES.75_4	0.146
337072			CH22_FGENES.448-5	0.146
334328			CH22_FGENES.375_5	0.146
327039			CH.21_hs gi|6531965	0.146
325576			CH.12_hs gi|6552443	0.147
315935	AI075804	Hs.132660	ESTs	0.147
319838	AA323758		EST cluster (not in UniGene)	0.147
334501			CH22_FGENES.397_17	0.147
338238			CH22_EM:AC005500.GENSCAN.264-4	0.147
308636	AI744063		EST singleton (not in UniGene) with exon hit	0.147
336567			CH22_FGENES.843_6	0.147
335819			CH22_FGENES.619_2	0.147
336950			CH22_FGENES.361-8	0.147
307055	AI148477		EST singleton (not in UniGene) with exon hit	0.147
315134	AW504854	Hs.126714	ESTs	0.147
335834			CH22_FGENES.621_1	0.147
327870			CH.06_hs gi|5868131	0.147
323802	AA332011	Hs.250138	protein phosphatase 2C; magnesium-dependent; catalytic subunit	0.147
329412			CH.X_hs gi|6682553	0.147
323791	AA333068		EST cluster (not in UniGene)	0.147
324126	AA385315		EST cluster (not in UniGene)	0.147
327865			CH.06_hs gi|5868130	0.147
333445			CH22_FGENES.154_2	0.147
321302	AA021351	Hs.158497	KIAA0724 gene product	0.147
336744			CH22_FGENES.118-9	0.147
323731	AA323414		EST cluster (not in UniGene)	0.148
320289	H07989		EST cluster (not in UniGene)	0.148
305488	AA749000		EST singleton (not in UniGene) with exon hit	0.148
305592	AA780594	Hs.62954	ferritin; heavy polypeptide 1	0.148
304094	H11295		EST singleton (not in UniGene) with exon hit	0.148
325040	AW296368		EST cluster (not in UniGene)	0.148
339034			CH22_DA59H18.GENSCAN.26-2	0.148
334504			CH22_FGENES.398_2	0.148
334778			CH22_FGENES.431_2	0.148
320148	U77494	Hs.119687	RAN binding protein 8	0.148
303584	AW173759	Hs.203401	ESTs	0.148
325826			CH.15_hs gi|5867048	0.148
331192	T55182	Hs.152571	ESTs; Highly similar to IGF-II mRNA-binding protein 2 [H.sapiens]	0.148

325785			CH.14_hs gi|6381957	0.148
333166			CH22_FGENES.91_8	0.148
336548			CH22_FGENES.841_5	0.148
337552			CH22_C4G1.GENSCAN.1-4	0.148
331775	AA382742	Hs.97151	EST	0.148
338936			CH22_DJ32I10.GENSCAN.19-6	0.148
331869	AA428554	Hs.104894	ESTs; Weakly similar to fibronectin precursor [H.sapiens]	0.148
332865			CH22_FGENES.28_5	0.148
328663			CH.07_hs gi|6004473	0.148
328436			CH.07_hs gi|5868417	0.148
311158	AI634864	Hs.250789	ESTs; Highly similar to similar to NEDD-4 [H.sapiens]	0.148
336942			CH22_FGENES.354-2	0.148
302282	R53169	Hs.246091	ESTs	0.149
333296			CH22_FGENES.132_3	0.149
333365			CH22_FGENES.142_2	0.149
311706	AW452392	Hs.252854	ESTs	0.149
337109			CH22_FGENES.489-2	0.149
315062	AW173300	Hs.190201	ESTs	0.149
333454			CH22_FGENES.157_3	0.149
334784			CH22_FGENES.432_9	0.149
333255			CH22_FGENES.118_3	0.149
337518			CH22_FGENES.814-7	0.149
320651	AA489268		EST cluster (not in UniGene)	0.149
323437	AA287567		EST cluster (not in UniGene)	0.149
328761			CH.07_hs gi|5868302	0.149
328787			CH.07_hs gi|5868309	0.149
335261			CH22_FGENES.520_2	0.149
300827	R16689	Hs.106004	ESTs	0.149
339263			CH22_BA354I12.GENSCAN.10-1	0.149
337412			CH22_FGENES.756-6	0.149
334414			CH22_FGENES.384_1	0.149
332931			CH22_FGENES.38_5	0.149
310801	AW270980	Hs.106346	novel centrosomal protein RanBPM	0.149
305216	AA669056		EST singleton (not in UniGene) with exon hit	0.149
314779	AA470122	Hs.190261	ESTs	0.149
338414			CH22_EM:AC005500.GENSCAN.341-27	0.149
303342	AW247361		EST cluster (not in UniGene) with exon hit	0.149
337509			CH22_FGENES.806-4	0.149
306631	AI001149		EST singleton (not in UniGene) with exon hit	0.149
302533	L36149	Hs.248116	chemokine (C motif) XC receptor 1	0.149
336536			CH22_FGENES.839_18	0.149
324666	T32458	Hs.14285	ESTs	0.149
310173	AI767433	Hs.170013	ESTs	0.149
333595			CH22_FGENES.211_2	0.149
335975			CH22_FGENES.652_9	0.15
306654	AI003654		EST singleton (not in UniGene) with exon hit	0.15
335025			CH22_FGENES.475_3	0.15
328711			CH.07_hs gi|5868271	0.15
328274			CH.07_hs gi|5868219	0.15
325505			CH.12_hs gi|6682451	0.15
329641			CH.14_p2 gi|6468233	0.15
304955	AA613504		EST singleton (not in UniGene) with exon hit	0.15
339103			CH22_DA59H18.GENSCAN.44-10	0.15
329636			CH.12_p2 gi|5302817	0.15
310118	AI203293	Hs.157489	ESTs	0.15
326056			CH.17_hs gi|5867184	0.15
303773	AA769074		EST cluster (not in UniGene) with exon hit	0.15
303153	U09759	Hs.8325	mitogen-activated protein kinase 9	0.15

TABLE 13A shows the accession numbers for those primekeys lacking unigeneID's for Table 13. For each probeset we have listed the gene cluster number from which the oligonucleotides were designed. Gene clusters were compiled using sequences derived from Genbank ESTs and mRNAs. These sequences were clustered based on sequence similarity using Clustering and Alignment Tools (DoubleTwist, Oakland California). The Genbank accession numbers for sequences comprising each cluster are listed in the "Accession" column.

Pkey: Unique Eos probeset identifier number
CAT number: Gene cluster number
Accession: Genbank accession numbers

Pkey	CAT number	Accession
322050	24275_1	AL137589 AA423949 BE222949 BE222694 AI199615 AW873116 AI277950 AW044290 AW630096
321439	1599424_1	H61962 W01567 N75711
321666	13653_22	BE259906 AA232518 AA013359 AL035788 AW160822 BE387134 BE002954 BE391839 AW161565 AI878841 BE616458 BE409981 BE387308 BE297436 BE315536 AA206924 R12012 AA214169 BE312812 BE387093 H11710 BE312009 BE260569 AA343566 AA219526 R34757 AA219749 BE336733 AA219751 AW411099 AA232408 BE018716 BE398089 AA206253 AA053487 AA114224 AV655868 AW732566 BE394087 AW732574 AA313442 BE336875 AA070548 BE259840 BE019828 AW732341 AA299916 BE019253 BE018238 BE387109 AA232304 BE255589 AW732585 AA181436 AA308777 AA075802 AW732521 AA314526 AA226747 BE409513 AA206168 BE388292 BE298782 BE387086 AA305310 AV652723 AA314918 BE615510 AW951763 BE398104 BE385195 BE407165 BE391336 BE390187 BE389189 BE540650 BE249884 BE385985 BE274245 BE391124 BE260080 AA182600 BE512821 BE390090 BE279398 BE279589 BE263454 BE515194 BE293569 BE272531 BE388814 BE384659 BE271685 BE561043 BE278449 BE302572 AW239076 AI750583 AA376179 AA112632 BE266324 BE266614 R13105 AA132286 BE296305 AI220355 AA205606 AA219527 AA219519 AW804310 AA083286 BE171208 T19693 AA338328 BE185868 AA903024 T92162 AA330119 BE410404 BE314668
300088	622937_1	AW576245 BE207878 AW299993 AI199558 AI285442 AW299994 AW394242 AW394184
322303	704603_1	AI357412 AI870708 AI590539 W07459
322394	27492_1	AW068287 AA310079 BE336702 AA356318 AA306059 AA346785 AW402633 AA311210 AW402909 N76879 AW402913 AW401920 AA321636 AA354474 C17297 C16938 AA311774 M29871 NM_002872 Z82188 AW405674 H94176 R89281 AA214723 AI014482 AW949347 T27749 AW804226 AW796964 AW404581 AF077208 NM_014029 W68830 W79652 AA353375 AW575218 AA552192 AA521232 AA702695 AA033975 AW407827 AA829948 N94402 AW628604 AI523308 N57605 AA641662 H42477 N52784 AI753478 AA768493 AA845729 W47391 N55270 AI090117 R89282 BE206172 AA076650 AA595650 AI218931 BE049397 AI433110 W74114 H94277 AI358627 AI085221 AI862818 AA835967 AW103905 AI640644 AA835507 AA856887 AA694392 AW337542 AI524410 BE045500 AI440060 AI358801 AW028238 AW205248 AI718264 R48618 AA357358 AI695002 AA897549 AW081065 AI433360 AI810783 AI620963 Z82188 AA360224
321758	44275_1	U29112 AI656540 AI364875 AI656246 AI990940
323109	155498_1	AA169345 AI762857 AI949997 AI809601 AI681948 AI221079 AW167404 AI347614 AI611090 AI023472 AI347683 AI027467 AW591788 AI380665 AA835735 AA836654 AI244028 AW193159 AI500112 AI918722 AI738693 AI702308 AA805365 AI766842
322533	38937_1	T59538 T59589 T59598 T59542 AF147374
321921	34680_1	AF070619 R20302 T80358
321927	21620_1	AJ223366 BE305086 AW820106 AA621983 BE305208 AI738475 AI380189 AW590847 AI127232 AA622706 AI380858 AA621975 AI587036 AA665743 AW204003 AI692234 AI002242_AI692219 AW137282 AW268783 AW295910 AI308015 AW301462 AI318288 AI318575 AI318117 AI345591 AI249650 AI246934 AI246864 AI246971 AW268311 AI249654 BE041907 AW732776
321932	265316_1	N72324 N52825 W19526 BE143464 AA376060
306971	14694_7	M83667 NM_005195 S63168 M83667 AW068039 AW630649 AI338577 AI018125 AI269878 AW242440 AI887823 AI342581 BE222416 AI582847 AI651011 AI660815 AI699574 BE550201 AI926996 AW665855 AI827752 AI761857 BE328168 BE222451 AI762201 AW000929 AW007207 BE042962 BE551843 BE465373 AI279179 AI949945 BE551862 AW051667 BE328076 BE222296 AW007229 AW772332 AI279801 AI934526 AI631938 AI770103 BE041412 AI417900 AI692655 AI869943 AW270119 AI431739 AI703347 AW770568 AW025473 AI701497 AI128026 BE328147 AW203980 BE046793 AW087704 AI674597 AI650732 AI813691 AI472092 AI695224 AI241217 AW207746 AI206840 AI271362 AI631788 AI911883 AI914619 AI380585 AI767501 AI823759 AI564116 AI190991 AI377369 AI814122 AI221623 AI354793 AI081988 AI391740 AI337435 BE467366 AI824347 AI565325 AI280038 AI640455 AI819744 BE467803 BE327524 AI149402 AI313187 BE219684 AW611948 AW665821 AI091260 AW044492 BE220366 AW025381 AW183264 AI694865 AI498474 AI129780 AI202028 AI566792 BE220659 AI928040 AI830698 AI493021 AW612488 AI913152 BE042965 AI631837 AI693873 AI498925 AI768668 AI401544 BE327023 AI693383 AI769874 AI744003 AW082273 AI686501 AI798177 AI985196 AI090033 AI432342 AI689918 AI638308 BE468080 BE219588 AI912119 BE219787 AW005392 BE326564 AI589039 AI860187 AI758143 AI338168 AI702938 BE221985 AI498727 AI918196 AI279735 AW771497 AI860133 AW237834 AW661759 AW028111 BE503416 AI360180 AW611715 AI871777 BE045447 BE326444 AI266547 AI800237 AI823315 AI478368 AI264281 AI675841 AI690041

		AI498018 AI554124 AI239893 AI864054 AI280099 AI192815 AI620465 AI080201 AW002057 BE500986 AI341131 AI818991 AI566137 AI123403 BE219192 AW183844 AI499842 AW137971 AW138720 AW015526 AW138160 AW243163 AW138705 AW139927 AW140006 AW138810 AW137450 AW206970 AW135419 AW205974 AA043494 BE465106 AW139955 AI741112 BE326942 AA043506 AI079957 AI942432 AI392902 AI097047 AI470599 AA514553 AA984008 N47849 AI654114 AA884832 AI796752 AI765290 AI301155 AW470358 BE222764 AI823569 AI651188 AI692695 AI476643 BE504307 AI767573 BE219719 AI932249 AW467075 AI913633 BE221966 AI091025 AA969215 AI799810 AA931170 BE048559 AI809606 AI138614 AI739456 AI674605 AW772068 AI089286 AI625787 AI263418 AW008638 AI928389 AW628997 AI470010 AI914168 AI760003 AI203050 AI334069 AI694788 BE045337 AI948659 AI912982 AI867131 AI192102 AI767583 AI347518 AI566005 AI625884 AI215888 AI633904 AW182265 AW614357 AI128030 AI343685 AI914283 AI985003 AI823578 AI493053 AI380285 AI633895 AI267880 AI538162 AI991552 BE219479 BE219296 AI302178 AW779296 AI913805 AI631644 AI566772 AI985498 AI942289 AI935659 AI339092 AI247432 AI686472 AI766886 AI017228 AI333272 AW301668 AI972218 AW082027 AI632974 AI474761 AI766127 AW236578 AW000966 AI870734 AI222399 AI871249 AI703448 BE464210 AI768037 AI871585 AI767871 AI738757 AI220732 AI681633 AI768783 AI684463 AI307339 AI263203 AW665264 BE463969 AI768786 AI439118 AI127913 BE218324 AI672342 BE220052 AI796163 AI221662 AW197672 AW025300 AI769681 AW612448 BE219757 AW072420 AI669980 AI830418 AW204353 AA047011 AA913868 AI739146 AI669954 AW470507 AW614835 AW302151 AW772372 AI762427 AW339902 AW303370 BE464775 AW299818 AW236072 AW195060 AW274737 AW263062 AW183846 AI868894 AW300493 AW172509 AW516876 AW593773 AW299474 AW303546 AI817323 AI823624 AI694005 AI934589 AI343479 AI861825 AI962726 AI765845 AW080318 AI640227 AI763042 AI768903 AW235386 AA738489 AW341293 AA588585 BE221732 AI914179 AW611669 AI572789 AW194735 AW236122 AW236007 AW612789 AW197501 AW195046 AI797145 AI864423 AI458934 AI342848 AI693227 AI912642 AI689993 AA932572 AA740269 AW470392 AW086020 AI221701 T69326 T70461 AI765579 AI338263 AI431721 AI394249 AI186462 AI823571 AI953665 AI497954 AI761057 AI678228 AI640302 AI948742 AA594626 AA883155 AI972682 AI804774 AI300407 AI433524 AA897341 AI401175 AI291071 AA021213 AI126509 AI948955 AI218835 AA903938 AA502610 AI498320 AA584267 AA935285 AI476253 AA489658 AA975053 AA715326 AA557139 AA126417 AA971455 AA557319 AI499738 AA911438 AI913637 AA494506 N90793 AI990724 AA131667 AA128164 AA046840 AI262557 AA131729 AA594926 T59467 AA436907 AA044630 AI589177 AI279237 AI880498 AI431822 AA708934 AW612558 AI634069 W03610 AI192272 BE550862 AI400879 AA708507 AI128003 AI375308 AI271423 AI199552 AA125977 AI366498 AA458662 AI694382 AA044627 AI636263 AI798270 T90146 AW014724 AI870812 AI948781 AA369965 AI094721 AW271817 AI262898 AI244680 T69252 AI934148 AA046357 W19109 AA028157 AW021924 AA253491 AI189397 AI934388 D58282 W21323 W24288 AI682972 AA293683 AA284566 AV659511 AA434184 H87089 AA040038 N57464 AA343709 AW805815 R89837
301119	33384_1	BE621320 BE266806 BE276582 AW516729 AF142579 AW451687 AK000069 AA325236 BE168997 W73105 AA715365 BE278873 AA808894 AA386371 AW517942 AW750993 BE140314 BE392384 BE621757 AA318192 BE548173 AW152607 AW166898 AA352215 AW841506 T59802 AF147378 AA335719 AW956069 T59668 AA826362 AI961329 AI290469 AW197375 AI805651 AA160748 AA581089 AI968889 AA581100 AA501478 AI621069 AA468534 AA503715 AA658457 AI144504 BE387827 AA159880
324019	262792_1	AW177009 AI381610
323437	189513_1	AA287567 AA252404 AW967735 AA287568 AA761222 AA865644 AA831245
307845	19804_10	BE514807 R43224 AI363450 AA450226 AF030942
324126	272259_1	AA385315 AI627453 AI050695 AI348281
309101	7570_1	AI340462 AI583268 AA079086 AI950777 AI301866 AI925108 AW876954 AW877000 AA525418 AA888549 AI934220 AW380220 AA804858 AI927576 T61151 AW384053 BE391691 AA533856 AA248400 T48202 N57156 R68346 R26020 AL050332 W30806 H61369 AA092592 AA230324 BE271217 AW372903 T48772 AA358002 AA094302 AA559856 AW373308 AW373315 AW373297 AW373311 AW373314 AW373309 AW877055 AW770140 AW379805 AI581609 AW384144 AA078921 AA715432 AA654210 AI004899 AA602209 W47464 AA506588 R26822 AU076528 AI535743 AI535704 AI535681
315703	119175_1	AA402307 D60405 D61237 D59891 AW964877 AA325215 AI459739 N36070 N25658 AA083684 AW293368 AI761958 AI741205 AI693175 AW873603 AI143269 AI187124 N25199 H19323 AI650842 AW316825 AA083842 AA935650 AW298404 AI472001 AI648568 R17676 R41625 AI123237 R17677 AI206866 F36920 AI654713 F34084 AA618029 AI915139 AW275194 AW514577 D80420 AW149850 Z40953 AI867861 AA927547 AA974344 AI825793 AI635565 AI652157 BE504748 AW295759 F16800 AW839796 F01781 AA909730 AA984010
301373	368214_1	AA595235 AW973839 T03040
323665	54093_1	AW248307 AA313452 AW951927 AA355981 BE566080
323676	220254_1	AI702835 AI758919 AI685405 AI952108 AI299207 AI400767 AW105389 AI952710 AA845312 AI784118 AI537315
302086	23306_1	X57138 NM_003514 Z98744 BE253911 BE256314 AI095013 AI138475
323731	226193_1	AA323414 AW664013 AI809377 AI276041 AW296883 AI798340
323791	232336_1	AA333068 AA331863 AA331838 AW962531 AA331442
325040	23854_1	AW296368 AA247632 AK002030 R15304 T08775 AW975664 AI186801 AA730688 AW190918 AI141176 AW513211 AI275071 AA988601 BE042933 BE045713 AW087176
324430	312113_1	AA464018 AA464079 AA468142
323892	477253_1	AA846318 W15478 AL042661
309488	1030131_1	AW131104 BE246610
302251	27216_4	AA333340 AW955834 R49755 U33428
302286	22717_6	R58438 AA358612
323915	110063_1	AL043362 AA350031 AW751972 BE549118
324594	330528_1	AA497090 AI351879 AI350914
301737	65_1	AI815981 AF287269 BE260960 BE263991 AA311733 F12145 F07345 Z43604 T29948 H64102 Z43611 T35364 N40667 AI909783 AW751045 AA160594 AI816064 AI307240 AI951554 AA641031 AA293045 AI942492 AI687077 R78689 H12368 AA894728 AI124930 AI423498 AA777759 AA614585 AW071822 T66288 AI418558 H21480 AI335011 AI051728 AA293436 AW302233 AW188628 N26393 AI076557 AI311022 AW451505 H62593 Z39666 H12315 AI761351 AI384142 F02935 AW571491 T35366 AI240745 H64151 AA503793 AA831948 AI627686 AI761531 F03591 F09782

301763	1688575_1	R01279 R05896 T86522
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330535	1374_-8	U11872
332634	10404_2	U24488 NM_007116

TABLE 13B shows the genomic positioning for those primekeys lacking unigene ID's and accession numbers in Table 13. For each predicted exon, we have listed the genomic sequence source used for prediction. Nucleotide locations of each predicted exon are also listed.

Pkey: Unique number corresponding to an Eos probeset
Ref: Sequence source. The 7 digit numbers in this column are Genbank Identifier (GI) numbers
Strand: Indicates DNA strand from which exons were predicted.
Nt_position: Indicates nucleotide positions of predicted exons.

Pkey	Ref	Strand	Nt_position
332791	Dunham, I. et.al.	Plus	72720-73316
332792	Dunham, I. et.al.	Plus	73381-73768
332810	Dunham, I. et.al.	Plus	304296-304384
332944	Dunham, I. et.al.	Plus	2414825-2414932
332972	Dunham, I. et.al.	Plus	2572152-2572236
333133	Dunham, I. et.al.	Plus	3360058-3360195
333154	Dunham, I. et.al.	Plus	3615887-3616019
333155	Dunham, I. et.al.	Plus	3616832-3617003
333227	Dunham, I. et.al.	Plus	3992866-3992968
333230	Dunham, I. et.al.	Plus	3995507-3996507
333298	Dunham, I. et.al.	Plus	4581537-4581947
333304	Dunham, I. et.al.	Plus	4629943-4630242
333305	Dunham, I. et.al.	Plus	4630388-4630645
333365	Dunham, I. et.al.	Plus	4786883-4787283
333383	Dunham, I. et.al.	Plus	4907179-4907277
333391	Dunham, I. et.al.	Plus	4916697-4916780
333392	Dunham, I. et.al.	Plus	4918294-4918433
333397	Dunham, I. et.al.	Plus	4922466-4922635
333403	Dunham, I. et.al.	Plus	4925140-4925256
333413	Dunham, I. et.al.	Plus	4943824-4943974
333445	Dunham, I. et.al.	Plus	5097827-5097885
333479	Dunham, I. et.al.	Plus	5272855-5272939
333481	Dunham, I. et.al.	Plus	5286358-5286505
333483	Dunham, I. et.al.	Plus	5297945-5298105
333516	Dunham, I. et.al.	Plus	5570204-5570390
333517	Dunham, I. et.al.	Plus	5570729-5570925
333518	Dunham, I. et.al.	Plus	5571761-5572025
333531	Dunham, I. et.al.	Plus	5622622-5622684
333566	Dunham, I. et.al.	Plus	5954226-5954473
333572	Dunham, I. et.al.	Plus	6026896-6027189
333586	Dunham, I. et.al.	Plus	6246834-6247314
333588	Dunham, I. et.al.	Plus	6255445-6255779
333594	Dunham, I. et.al.	Plus	6308990-6309450
333595	Dunham, I. et.al.	Plus	6323103-6323348
333600	Dunham, I. et.al.	Plus	6355629-6355925
333601	Dunham, I. et.al.	Plus	6360075-6360442
333607	Dunham, I. et.al.	Plus	6504431-6504690
333612	Dunham, I. et.al.	Plus	6549563-6549697
333613	Dunham, I. et.al.	Plus	6550643-6550748
333614	Dunham, I. et.al.	Plus	6551227-6551389
333624	Dunham, I. et.al.	Plus	6595146-6595244
333626	Dunham, I. et.al.	Plus	6614174-6614467
333635	Dunham, I. et.al.	Plus	6663683-6663973
333637	Dunham, I. et.al.	Plus	6674968-6675134
333642	Dunham, I. et.al.	Plus	6708760-6709139
333647	Dunham, I. et.al.	Plus	6772502-6772779
333653	Dunham, I. et.al.	Plus	6811130-6811392
333654	Dunham, I. et.al.	Plus	6816731-6816993
333656	Dunham, I. et.al.	Plus	6822087-6822406
333657	Dunham, I. et.al.	Plus	6831369-6831445
333658	Dunham, I. et.al.	Plus	6835282-6835474

333659	Dunham, I. et.al.	Plus	6836179-6836248
333684	Dunham, I. et.al.	Plus	7169561-7169742
333686	Dunham, I. et.al.	Plus	7177117-7177302
333697	Dunham, I. et.al.	Plus	7203859-7203934
333698	Dunham, I. et.al.	Plus	7205279-7205383
333699	Dunham, I. et.al.	Plus	7206101-7206175
333703	Dunham, I. et.al.	Plus	7215559-7215663
333709	Dunham, I. et.al.	Plus	7229730-7229835
333747	Dunham, I. et.al.	Plus	7605884-7606206
333774	Dunham, I. et.al.	Plus	7716509-7716636
333775	Dunham, I. et.al.	Plus	7729983-7730149
333806	Dunham, I. et.al.	Plus	7877475-7877666
333843	Dunham, I. et.al.	Plus	7978762-7978887
333854	Dunham, I. et.al.	Plus	8029446-8029524
333873	Dunham, I. et.al.	Plus	8133266-8133429
333880	Dunham, I. et.al.	Plus	8151923-8152133
333885	Dunham, I. et.al.	Plus	8154352-8154437
333918	Dunham, I. et.al.	Plus	8307124-8307215
333947	Dunham, I. et.al.	Plus	8579888-8579966
333961	Dunham, I. et.al.	Plus	8617999-8618104
333981	Dunham, I. et.al.	Plus	8782374-8782643
333991	Dunham, I. et.al.	Plus	8837419-8837551
333994	Dunham, I. et.al.	Plus	8852749-8852894
334030	Dunham, I. et.al.	Plus	9288463-9288782
334083	Dunham, I. et.al.	Plus	9837016-9837081
334111	Dunham, I. et.al.	Plus	10279365-10279531
334135	Dunham, I. et.al.	Plus	10457085-10457183
334218	Dunham, I. et.al.	Plus	12680289-12680378
334249	Dunham, I. et.al.	Plus	13190430-13190574
334262	Dunham, I. et.al.	Plus	13231452-13231581
334264	Dunham, I. et.al.	Plus	13234447-13234544
334327	Dunham, I. et.al.	Plus	13577413-13577496
334328	Dunham, I. et.al.	Plus	13589868-13589936
334340	Dunham, I. et.al.	Plus	13642407-13642522
334454	Dunham, I. et.al.	Plus	14326506-14326738
334504	Dunham, I. et.al.	Plus	14510206-14510398
334508	Dunham, I. et.al.	Plus	14514936-14515122
334512	Dunham, I. et.al.	Plus	14545933-14546366
334582	Dunham, I. et.al.	Plus	15026255-15026371
334659	Dunham, I. et.al.	Plus	15460624-15460726
334721	Dunham, I. et.al.	Plus	15796816-15796987
334723	Dunham, I. et.al.	Plus	15805317-15805399
334730	Dunham, I. et.al.	Plus	15967830-15967934
334774	Dunham, I. et.al.	Plus	16251857-16252178
334778	Dunham, I. et.al.	Plus	16276180-16276395
334851	Dunham, I. et.al.	Plus	17820110-17820810
334885	Dunham, I. et.al.	Plus	19233667-19233787
334902	Dunham, I. et.al.	Plus	19317083-19317195
334905	Dunham, I. et.al.	Plus	19322553-19322680
334906	Dunham, I. et.al.	Plus	19323493-19323590
334910	Dunham, I. et.al.	Plus	19398155-19398684
335018	Dunham, I. et.al.	Plus	20688288-20688415
335025	Dunham, I. et.al.	Plus	20743941-20744050
335033	Dunham, I. et.al.	Plus	20753188-20753314
335044	Dunham, I. et.al.	Plus	20842088-20842682
335142	Dunham, I. et.al.	Plus	21465105-21465186
335157	Dunham, I. et.al.	Plus	21543302-21544341
335160	Dunham, I. et.al.	Plus	21573388-21573497
335174	Dunham, I. et.al.	Plus	21631301-21631447
335188	Dunham, I. et.al.	Plus	21669118-21669328
335190	Dunham, I. et.al.	Plus	21680807-21680876
335191	Dunham, I. et.al.	Plus	21681110-21681183
335193	Dunham, I. et.al.	Plus	21692208-21692362
335204	Dunham, I. et.al.	Plus	21750636-21750726
335222	Dunham, I. et.al.	Plus	21885542-21885608
335226	Dunham, I. et.al.	Plus	21890838-21890930
335227	Dunham, I. et.al.	Plus	21892145-21892289
335309	Dunham, I. et.al.	Plus	22500158-22500276
335310	Dunham, I. et.al.	Plus	22500714-22500831

335311	Dunham, I. et.al.	Plus	22501602-22501676
335355	Dunham, I. et.al.	Plus	22779222-22779516
335362	Dunham, I. et.al.	Plus	22809167-22809461
335368	Dunham, I. et.al.	Plus	22843040-22843184
335384	Dunham, I. et.al.	Plus	22918150-22918263
335385	Dunham, I. et.al.	Plus	22919072-22919339
335436	Dunham, I. et.al.	Plus	23427793-23427923
335440	Dunham, I. et.al.	Plus	23458702-23459017
335441	Dunham, I. et.al.	Plus	23460632-23460724
335450	Dunham, I. et.al.	Plus	23480190-23480270
335453	Dunham, I. et.al.	Plus	23483333-23483459
335458	Dunham, I. et.al.	Plus	23490034-23490143
335464	Dunham, I. et.al.	Plus	23500331-23500496
335496	Dunham, I. et.al.	Plus	24164386-24164545
335497	Dunham, I. et.al.	Plus	24167668-24167869
335498	Dunham, I. et.al.	Plus	24172082-24172161
335499	Dunham, I. et.al.	Plus	24176698-24176869
335500	Dunham, I. et.al.	Plus	24178236-24178326
335507	Dunham, I. et.al.	Plus	24219973-24220039
335510	Dunham, I. et.al.	Plus	24222975-24223118
335513	Dunham, I. et.al.	Plus	24224272-24224496
335627	Dunham, I. et.al.	Plus	25150005-25150061
335651	Dunham, I. et.al.	Plus	25317560-25317696
335655	Dunham, I. et.al.	Plus	25333211-25333369
335656	Dunham, I. et.al.	Plus	25333601-25333751
335658	Dunham, I. et.al.	Plus	25336315-25336406
335663	Dunham, I. et.al.	Plus	25342680-25342802
335665	Dunham, I. et.al.	Plus	25344098-25344287
335667	Dunham, I. et.al.	Plus	25345735-25345856
335668	Dunham, I. et.al.	Plus	25346313-25346447
335689	Dunham, I. et.al.	Plus	25454350-25454604
335690	Dunham, I. et.al.	Plus	25455442-25455625
335715	Dunham, I. et.al.	Plus	25565941-25566052
335719	Dunham, I. et.al.	Plus	25593936-25594101
335734	Dunham, I. et.al.	Plus	25688723-25688869
335744	Dunham, I. et.al.	Plus	25716483-25716615
335809	Dunham, I. et.al.	Plus	26310772-26310909
335819	Dunham, I. et.al.	Plus	26356341-26356470
335822	Dunham, I. et.al.	Plus	26364087-26364196
335872	Dunham, I. et.al.	Plus	26820760-26820943
335885	Dunham, I. et.al.	Plus	26933436-26933534
335968	Dunham, I. et.al.	Plus	27743843-27744029
335971	Dunham, I. et.al.	Plus	27752808-27753017
335975	Dunham, I. et.al.	Plus	27801321-27801391
335976	Dunham, I. et.al.	Plus	27809041-27809187
335989	Dunham, I. et.al.	Plus	27983788-27983860
335990	Dunham, I. et.al.	Plus	27988532-27988608
336010	Dunham, I. et.al.	Plus	28570239-28570330
336093	Dunham, I. et.al.	Plus	29556922-29557002
336126	Dunham, I. et.al.	Plus	30057891-30058105
336129	Dunham, I. et.al.	Plus	30062259-30062348
336187	Dunham, I. et.al.	Plus	30433494-30433585
336188	Dunham, I. et.al.	Plus	30434870-30435004
336225	Dunham, I. et.al.	Plus	30833614-30833788
336371	Dunham, I. et.al.	Plus	33968108-33968204
336373	Dunham, I. et.al.	Plus	33976308-33976504
336377	Dunham, I. et.al.	Plus	33994489-33994599
336380	Dunham, I. et.al.	Plus	33995323-33995434
336383	Dunham, I. et.al.	Plus	34005784-34005964
336384	Dunham, I. et.al.	Plus	34007429-34007559
336385	Dunham, I. et.al.	Plus	34007879-34008159
336386	Dunham, I. et.al.	Plus	34012965-34013115
336441	Dunham, I. et.al.	Plus	34187606-34187663
336444	Dunham, I. et.al.	Plus	34190585-34190718
336484	Dunham, I. et.al.	Plus	34237425-34237505
336497	Dunham, I. et.al.	Plus	34267190-34267245
336499	Dunham, I. et.al.	Plus	34267504-34267572
336503	Dunham, I. et.al.	Plus	34271306-34271372
336548	Dunham, I. et.al.	Plus	34353881-34354826

336552	Dunham, I. et.al.	Plus	34356420-34356527
336553	Dunham, I. et.al.	Plus	34356683-34356753
336567	Dunham, I. et.al.	Plus	34428228-34428395
336568	Dunham, I. et.al.	Plus	34428521-34428637
336659	Dunham, I. et.al.	Plus	1896402-1896478
336715	Dunham, I. et.al.	Plus	3110198-3110314
336803	Dunham, I. et.al.	Plus	6106904-6106990
336805	Dunham, I. et.al.	Plus	6126661-6126786
336850	Dunham, I. et.al.	Plus	7745284-7745355
336857	Dunham, I. et.al.	Plus	8130457-8130612
336911	Dunham, I. et.al.	Plus	11035818-11035984
336949	Dunham, I. et.al.	Plus	12818687-12818891
336950	Dunham, I. et.al.	Plus	12875843-12875912
336958	Dunham, I. et.al.	Plus	13203550-13203973
336993	Dunham, I. et.al.	Plus	15096270-15096324
337076	Dunham, I. et.al.	Plus	19338177-19338679
337109	Dunham, I. et.al.	Plus	21166580-21166650
337123	Dunham, I. et.al.	Plus	22052874-22052942
337151	Dunham, I. et.al.	Plus	23106433-23106510
337189	Dunham, I. et.al.	Plus	24225887-24225954
337241	Dunham, I. et.al.	Plus	27280182-27280313
337337	Dunham, I. et.al.	Plus	30395182-30395285
337353	Dunham, I. et.al.	Plus	30804624-30804780
337384	Dunham, I. et.al.	Plus	31333399-31333580
337398	Dunham, I. et.al.	Plus	31585902-31586067
337414	Dunham, I. et.al.	Plus	31953012-31953205
337418	Dunham, I. et.al.	Plus	32014049-32014131
337461	Dunham, I. et.al.	Plus	32803968-32804028
337480	Dunham, I. et.al.	Plus	33219714-33219779
337482	Dunham, I. et.al.	Plus	33227865-33227946
337483	Dunham, I. et.al.	Plus	33237292-33237427
337490	Dunham, I. et.al.	Plus	33318571-33318644
337522	Dunham, I. et.al.	Plus	33963188-33963979
337532	Dunham, I. et.al.	Plus	34187269-34187366
337552	Dunham, I. et.al.	Plus	19497-19600
337584	Dunham, I. et.al.	Plus	945236-945452
337611	Dunham, I. et.al.	Plus	1482883-1483016
337672	Dunham, I. et.al.	Plus	3331236-3331313
337693	Dunham, I. et.al.	Plus	3575975-3576153
337738	Dunham, I. et.al.	Plus	3865738-3865814
337926	Dunham, I. et.al.	Plus	6286377-6286470
337927	Dunham, I. et.al.	Plus	6343033-6343172
337935	Dunham, I. et.al.	Plus	6534661-6534782
337944	Dunham, I. et.al.	Plus	6589383-6589450
337954	Dunham, I. et.al.	Plus	6831483-6831620
337996	Dunham, I. et.al.	Plus	7445532-7445633
338004	Dunham, I. et.al.	Plus	7601363-7601520
338016	Dunham, I. et.al.	Plus	7863131-7863310
338174	Dunham, I. et.al.	Plus	12771102-12771268
338176	Dunham, I. et.al.	Plus	12774072-12774223
338238	Dunham, I. et.al.	Plus	14661936-14662015
338277	Dunham, I. et.al.	Plus	16167622-16167962
338294	Dunham, I. et.al.	Plus	16463958-16464539
338316	Dunham, I. et.al.	Plus	17089711-17089988
338323	Dunham, I. et.al.	Plus	17154655-17154792
338324	Dunham, I. et.al.	Plus	17155309-17155574
338386	Dunham, I. et.al.	Plus	18611213-18611407
338398	Dunham, I. et.al.	Plus	18953492-18953581
338410	Dunham, I. et.al.	Plus	19292807-19292916
338414	Dunham, I. et.al.	Plus	19345573-19345660
338460	Dunham, I. et.al.	Plus	20233372-20233488
338481	Dunham, I. et.al.	Plus	20942659-20942873
338489	Dunham, I. et.al.	Plus	21142605-21143049
338500	Dunham, I. et.al.	Plus	21253847-21253974
338514	Dunham, I. et.al.	Plus	21379420-21379655
338530	Dunham, I. et.al.	Plus	21636361-21636509
338620	Dunham, I. et.al.	Plus	23540239-23540334
338631	Dunham, I. et.al.	Plus	23711167-23711241
338653	Dunham, I. et.al.	Plus	24219427-24219509

338660	Dunham, I. et.al.	Plus	24387122-24387266
338704	Dunham, I. et.al.	Plus	25230432-25230548
338847	Dunham, I. et.al.	Plus	27995337-27995420
338887	Dunham, I. et.al.	Plus	28465244-28465384
338895	Dunham, I. et.al.	Plus	28598893-28599135
338915	Dunham, I. et.al.	Plus	28824881-28824977
338925	Dunham, I. et.al.	Plus	28883892-28884036
338936	Dunham, I. et.al.	Plus	29148022-29148160
338952	Dunham, I. et.al.	Plus	29418831-29418968
338980	Dunham, I. et.al.	Plus	29896789-29896874
338981	Dunham, I. et.al.	Plus	29897917-29898008
338986	Dunham, I. et.al.	Plus	30007287-30007415
339009	Dunham, I. et.al.	Plus	30348477-30348598
339017	Dunham, I. et.al.	Plus	30420896-30421090
339045	Dunham, I. et.al.	Plus	30744286-30744356
339046	Dunham, I. et.al.	Plus	30746269-30746420
339059	Dunham, I. et.al.	Plus	30814655-30814801
339067	Dunham, I. et.al.	Plus	30869347-30869412
339069	Dunham, I. et.al.	Plus	30880975-30881070
339078	Dunham, I. et.al.	Plus	30914310-30914423
339084	Dunham, I. et.al.	Plus	30944556-30944803
339101	Dunham, I. et.al.	Plus	31158047-31158123
339102	Dunham, I. et.al.	Plus	31169321-31169563
339103	Dunham, I. et.al.	Plus	31170343-31170454
339115	Dunham, I. et.al.	Plus	31459869-31459927
339157	Dunham, I. et.al.	Plus	32131701-32131833
339166	Dunham, I. et.al.	Plus	32210902-32211006
339167	Dunham, I. et.al.	Plus	32213567-32213730
339288	Dunham, I. et.al.	Plus	33169611-33169691
339289	Dunham, I. et.al.	Plus	33186756-33186903
339291	Dunham, I. et.al.	Plus	33205057-33205247
339407	Dunham, I. et.al.	Plus	34189461-34189620
332865	Dunham, I. et.al.	Minus	1391482-1391218
332881	Dunham, I. et.al.	Minus	1563520-1563184
332930	Dunham, I. et.al.	Minus	2022565-2022497
332931	Dunham, I. et.al.	Minus	2023651-2023562
332984	Dunham, I. et.al.	Minus	2632606-2632457
332986	Dunham, I. et.al.	Minus	2635398-2635206
332997	Dunham, I. et.al.	Minus	2710509-2710375
333051	Dunham, I. et.al.	Minus	2991973-2991840
333061	Dunham, I. et.al.	Minus	3029631-3029527
333064	Dunham, I. et.al.	Minus	3030722-3030623
333096	Dunham, I. et.al.	Minus	3184234-3184118
333099	Dunham, I. et.al.	Minus	3206796-3206674
333106	Dunham, I. et.al.	Minus	3230744-3230547
333160	Dunham, I. et.al.	Minus	3654893-3654678
333163	Dunham, I. et.al.	Minus	3665124-3664962
333165	Dunham, I. et.al.	Minus	3674052-3673905
333168	Dunham, I. et.al.	Minus	3694664-3694567
333170	Dunham, I. et.al.	Minus	3733394-3733299
333174	Dunham, I. et.al.	Minus	3764284-3764210
333188	Dunham, I. et.al.	Minus	3826990-3826863
333214	Dunham, I. et.al.	Minus	3966559-3966437
333232	Dunham, I. et.al.	Minus	4001551-4001365
333237	Dunham, I. et.al.	Minus	4003326-4003219
333239	Dunham, I. et.al.	Minus	4095861-4094462
333255	Dunham, I. et.al.	Minus	4297883-4297716
333259	Dunham, I. et.al.	Minus	4308769-4308639
333274	Dunham, I. et.al.	Minus	4389146-4388954
333290	Dunham, I. et.al.	Minus	4530734-4530554
333295	Dunham, I. et.al.	Minus	4549290-4549198
333296	Dunham, I. et.al.	Minus	4550766-4550644
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325470	6017034	Plus	287578-287663
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329759	6048280	Minus	37647-37730
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329893	6525313	Minus	166123-166791
329899	6563505	Minus	111058-111783
325988	5867064	Plus	17349-17606
325855	5867067	Plus	276141-276251
325999	5867073	Plus	149115-149192
326001	5867073	Plus	155223-155348
325886	5867087	Plus	194694-194915
325882	5867087	Minus	8178-8347
325905	5867104	Plus	78779-78876
325922	5867122	Minus	329063-329134
325937	5867132	Minus	152633-152902
325960	5867147	Minus	162506-162635
325961	5867147	Minus	165106-165209
325838	6552452	Plus	171451-171532
325839	6552452	Plus	181964-182037
325840	6552452	Plus	184380-184547
325844	6552453	Minus	14188-14332
325870	6682492	Plus	228209-228297
329984	4646193	Minus	139780-139890
329976	4878063	Minus	62584-62691
329935	6165200	Minus	69059-69127
329916	6223624	Plus	36396-37195
330021	6671889	Plus	120938-121032
330024	6671908	Minus	1005-1270
330028	6671908	Minus	30015-30144
326033	5867178	Plus	37261-37333
326036	5867178	Minus	120215-120273
326056	5867184	Minus	181553-181690
326116	5867193	Plus	45548-45604
326122	5867194	Plus	144397-144683
326138	5867203	Minus	179374-179436

326145	5867204	Minus	52599-52814
326180	5867211	Minus	182758-183222
326201	5867216	Minus	166168-166959
326207	5867222	Plus	48139-48219
326228	5867230	Plus	52644-52705
326233	5867232	Plus	124788-124863
326238	5867260	Plus	64282-64338
326241	5867260	Minus	181648-181916
326243	5867261	Plus	123838-123978
326251	5867263	Minus	82716-82822
326268	5867267	Plus	122114-122765
326124	5916395	Plus	407102-407560
326339	6056311	Minus	164637-165251
330049	4567182	Minus	314662-315210
326358	5867293	Plus	9122-9195
326365	5867297	Minus	96630-96764
326379	5867327	Plus	32299-32402
326382	5867327	Minus	50420-50503
326390	5867340	Minus	108814-110592
326424	5867369	Minus	168329-168409
326453	5867399	Plus	86222-86423
326472	5867404	Plus	293739-293940
326492	5867422	Plus	120768-120991
326533	5867441	Minus	.532153-532280
330117	6015201	Minus	7340-7680
330115	6015202	Plus	11403-11677
330116	6015202	Plus	12109-12418
330095	6015278	Plus	15343-15814
330096	6015278	Plus	49370-49458
326644	5867559	Plus	42684-42819
326713	5867595	Plus	121511-121798
326745	5867611	Plus	127130-127318
326752	5867615	Minus	1214-1562
326753	5867616	Plus	12454-12511
326598	5867634	Plus	68955-69014
326667	6552455	Plus	142311-142441
326855	6552460	Minus	111390-111463
326812	6682504	Plus	189811-189941
327005	5867664	Plus	610847-610907
327008	5867664	Plus	928737-928811
326896	5867680	Minus	12032-12122
326904	5867684	Minus	9280-9606
326951	6004446	Plus	193812-193998
326941	6004446	Plus	62018-62896
326943	6004446	Minus	89242-89427
326928	6456782	Minus	291007-291219
326958	6469836	Minus	42952-43082
326959	6469836	Minus	43159-43301
327039	6531965	Plus	694486-694998
327127	6682520	Plus	41925-42083
330158	6580367	Plus	81966-82456
327204	5867447	Plus	165135-165239
327208	5867447	Plus	180805-180864
327266	5867462	Minus	82400-82615
327277	5867473	Minus	165616-165715
327289	5867481	Plus	49296-49536
327298	5867492	Plus	7627-8166
327237	5867544	Minus	59702-59813
327145	5867548	Minus	40482-40551
327333	5902477	Minus	141448-141609
327335	5902477	Minus	142979-143124
327343	6017017	Minus	12288-12395
327350	6249563	Minus	41890-41985
327358	6552411	Minus	3802-3950
327360	6552411	Minus	6255-6422
327409	5867750	Minus	52949-53011
327424	5867751	Plus	160442-160598
327430	5867754	Plus	1320-1403
327470	5867772	Plus	150910-150973

327460	6004455	Plus	176245-175343
327498	6017023	Minus	42178-42283
327509	6117815	Minus	54882-55053
327510	6117815	Minus	56824-56944
327512	6117815	Plus	176258-176325
327535	6525279	Plus	19105-19175
330163	6042042	Minus	20321-20385
330171	6648220	Plus	110889-111575
327579	5867824	Minus	37229-38335
327672	5867843	Minus	69649-69740
327629	5867872	Plus	49692-49811
327640	5867890	Plus	9448-9566
327649	5867899	Plus	205871-205927
327612	6525283	Plus	2747-2924
327718	6525284	Plus	86123-86186
327801	5867924	Plus	23239-23348
327762	5867961	Minus	50303-50439
327763	5867961	Plus	229347-229476
327776	5867964	Minus	164308-164486
327822	5867968	Minus	168886-169633
327823	5867968	Minus	170359-170433
327807	5867968	Plus	33745-33811
327845	6531962	Plus	193402-193549
330228	6013527	Minus	.3719-3787
330190	6165182	Plus	36103-36243
328122	5868031	Plus	158474-158656
328132	5868038	Minus	126737-126839
328159	5868065	Minus	52957-53162
328168	5868071	Plus	60321-60479
328175	5868073	Plus	208-271
328217	5868096	Minus	3742-4362
327865	5868130	Plus	61503-62205
327866	5868131	Minus	2893-3046
327870	5868131	Plus	53558-53757
327879	5868142	Minus	77722-77793
327902	5868158	Minus	133339-133467
327918	5868165	Plus	547530-547591
327934	5868184	Plus	41830-42036
327959	5868210	Minus	46497-46682
327976	5868212	Minus	349301-349409
328020	5902482	Minus	556386-556652
328042	5902482	Minus	1985085-1986626
328008	5902482	Plus	296663-297151
330301	2905862	Minus	4420-5781
330299	2905881	Minus	1020-1382
328274	5868219	Minus	31244-31439
328595	5868224	Plus	148738-148967
328591	5868227	Minus	237647-237726
328668	5868254	Minus	10888-10984
328677	5868256	Minus	58708-58950
328687	5868262	Plus	624479-624585
328706	5868270	Plus	165501-165614
328711	5868271	Minus	97797-97990
328730	5868289	Plus	8068-8214
328732	5868289	Plus	37437-37550
328734	5868289	Plus	50559-50747
328752	5868298	Minus	114911-115087
328755	5868301	Minus	145959-146446
328761	5868302	Minus	239308-239412
328775	5868309	Plus	12845-12920
328784	5868309	Minus	74523-74604
328787	5868309	Plus	135772-135963
328809	5868327	Plus	91792-91849
328829	5868337	Plus	36309-36630
328280	5868352	Plus	160563-160631
328311	5868371	Minus	170560-170826
328318	5868373	Plus	414945-415620
328323	5868373	Minus	1080089-1080235
328348	5868383	Minus	260272-260379

328377	5868390	Plus	16947-17023
328436	5868417	Plus	203760-203904
328504	5868471	Plus	47084-47217
328506	5868471	Plus	60716-60830
328522	5868477	Plus	1972307-1972452
328525	5868482	Plus	12387-14313
328541	5868486	Plus	130956-131050
328662	6004473	Plus	1184773-1184855
328663	6004473	Plus	1185279-1186634
328803	6004475	Minus	291716-291948
328304	6004478	Minus	3884-3952
328927	5868500	Minus	428829-428893
328936	5868500	Minus	1352202-1352259
328939	6004481	Minus	131139-131320
328941	6456765	Minus	9817-9885
328948	6456765	Plus	28227-28413
328968	6456775	Plus	117442-118283
330316	6007576	Minus	119761-119931
330350	3056622	Minus	26413-26820
330351	3056622	Minus	27522-27614
330348	4544475	Minus	19855-19962
329034	5868561	Minus	32819-32939
329046	5868569	Plus	18971-19030
329053	5868574	Plus	426453-426541
329186	5868711	Minus	13108-13225
329237	5868729	Plus	133238-133339
329276	5868762	Minus	222629-222709
329333	5868806	Plus	392666-392746
329376	5868859	Plus	52356-52694
329384	5868869	Minus	116524-116662
329140	6017060	Plus	290842-290905
329317	6381976	Plus	614823-615209
329319	6381976	Plus	721390-721470
329129	6588026	Plus	144569-144712
329373	6682537	Minus	38950-39301
329412	6682553	Minus	68948-69041
329424	5868879	Plus	362196-362344
329446	5868886	Plus	84776-84899
329449	5868886	Plus	97697-97771

TABLE 14: shows genes, including expression sequence tags, down-regulated in prostate tumor tissue compared to normal prostate tissue as analyzed using Affymetrix/Eos Hu02 GeneChip array. Shown are the ratios of "average" normal prostate to "average" prostate cancer tissues.

Pkey:	Unique Eos probeset identifier number
ExAccn:	Exemplar Accession number, Genbank accession numbe
UnigeneID:	Unigene number
Unigene Title:	Unigene gene title
R1:	Background subtracted normal prostate : prostate tumor tissue

Pkey	ExAccn	UnigeneID	Unigene Title	R1
331328	AA281133	Hs.88808	ESTs	18.53
320875	D60641	Hs.131921	ESTs	14.55
300994	AI251936	Hs.146298	ESTs	12.17
323461	AA418762	Hs.190044	ESTs	10.55
301015	AA947682	Hs.217173	ESTs; Weakly similar to Chain A; Cdc42hs-Gdp Complex [H.sapiens]	10.17
319419	AA543096	Hs.13648	ESTs; Highly similar to mitogen-induced [M.musculus]	9.2
323486	C05278	Hs.166800	ESTs; Moderately similar to [PYRUVATE DEHYDROGENASE(LIPOAMIDE)] KINASE ISOZYME 4 PRECURSOR [H.sapiens]	8.87
324882	AW419080	Hs.250645	ESTs	8
330569	U57796	Hs.57679	zinc finger protein 192	7.88
330126			CH.21_p2 gi|6093735	7.8
316265	AA737400	Hs.142230	ESTs	7.7
323045	AA148950	Hs.188836	ESTs	7.64
320668	R58399	Hs.146217	ESTs	7.4
330769	AA465192	Hs.16514	ESTs	7.15
312614	AI766732	Hs.201194	ESTs	7
314790	AW341754	Hs.189305	ESTs	6.83
309979	AW452118	Hs.257533	EST	6.74
314236	AA743396	Hs.189023	ESTs	6.49
329192			CH.X_hs gi|5868716	6.1
324307	AA627642	Hs.4994	transducer of ERBB2; 2 (TOB2)	5.99
303685	AW500106		EST cluster (not in UniGene) with exon hit	5.82
314921	AW452382	Hs.257564	ESTs	5.8
315840	AA679001	Hs.192221	ESTs	5.68
332776	AA034364	Hs.256551	ESTs; Weakly similar to !!!! ALU CLASS B WARNING ENTRY !!!! [H.sapiens]	5.43
313533	AW298141	Hs.157975	ESTs	5.4
303494	F30712		EST cluster (not in UniGene) with exon hit	5.35
317490	AI627358	Hs.148367	ESTs	5.31
332546	D84454	Hs.21899	solute carrier family 35 (UDP-galactose transporter); member 2	5.25
334719			CH22_FGENES.421_30	5.25
300679	AA813958	Hs.207727	ESTs; Moderately similar to KIAA0071 [H.sapiens]	5.22
311811	AI625304	Hs.190312	ESTs	5.22
315310	AW511298	Hs.256067	ESTs	5.19
312871	H86747	Hs.227602	KIAA1116 protein	5.11
324715	AI739168		EST cluster (not in UniGene)	4.97
313870	AW206435	Hs.146057	ESTs	4.97
321453	N50080	Hs.117827	ESTs	4.78
316160	AW197887	Hs.253353	ESTs	4.63
313833	AA766825		EST cluster (not in UniGene)	4.58
315850	AW270550	Hs.116957	ESTs	4.53
303124	AF161350		EST cluster (not in UniGene) with exon hit	4.46
323346	AL134932	Hs.143607	ESTs	4.4
301383	AA913591	Hs.126480	ESTs	4.35
324513	AW501678	Hs.164577	ESTs	4.28
303480	AA331906		EST cluster (not in UniGene) with exon hit	4.25
323591	AA301270		EST cluster (not in UniGene)	4.22
313603	AW468119		EST cluster (not in UniGene)	4.2
317863	AI733395	Hs.129124	ESTs	4.1
312381	R42049	Hs.195473	ESTs	4.08
317514	AW451570	Hs.126850	ESTs	4.03
319750	AA621606	Hs.117956	ESTs	4.03

322520	T55958		EST cluster (not in UniGene)	4
314754	AW026761	Hs.134374	ESTs	4
316088	AI990652	Hs.208973	ESTs	4
318473	AI939339	Hs.146883	ESTs	3.96
307848	AI364186		EST singleton (not in UniGene) with exon hit	3.95
300730	AW449204	Hs.257125	ESTs	3.94
303034	W60843	Hs.31570	ESTs	3.93
324668	AI679131	Hs.201424	ESTs	3.9
324874	AA541323	Hs.115831	ESTs	3.88
300547	N53442	Hs.143443	ESTs	3.83
316100	AW203986	Hs.213003	ESTs	3.79
314801	AA481027	Hs.127336	ESTs; Weakly similar to ORF YGR245c [S.cerevisiae]	3.75
320856	D59945		EST cluster (not in UniGene)	3.74
313188	AI039702	Hs.179573	collagen; type I; alpha 2	3.73
314187	AA804409	Hs.118920	ESTs	3.73
311826	AA765470	Hs.122826	ESTs	3.7
302358	D81150		EST cluster (not in UniGene) with exon hit	3.68
311441	Z38720	Hs.151014	ESTs	3.66
321914	AA011603		EST cluster (not in UniGene)	3.59
332216	H95082	Hs.102332	EST	3.52
324771	AA631739		EST cluster (not in UniGene)	3.5
323691	AA317561		EST cluster (not in UniGene)	3.49
303525	AW516519	Hs.115130	ESTs	3.47
309709	AW242630		EST singleton (not in UniGene) with exon hit	3.46
300038			AFFX control: MurIL4	3.38
316526	AI088192	Hs.135474	ESTs; Weakly similar to ATP-DEPENDENT RNA HELICASE A [H.sapiens]	3.36
313029	AA731520	Hs.170504	ESTs	3.35
304356	AA196027	Hs.195188	glyceraldehyde-3-phosphate dehydrogenase	3.34
314610	AI948688	Hs.191805	ESTs	3.33
329815			CH.14_p2 gi|6624888	3.32
314949	AI745387	Hs.239124	ESTs	3.31
300598	N53574	Hs.158932	ESTs	3.3
329218			CH.X_hs gi|5869726	3.28
315706	AW440742	Hs.155556	ESTs	3.28
303751	AW503637		EST cluster (not in UniGene) with exon hit	3.25
307783	AI347274		EST singleton (not in UniGene) with exon hit	3.25
321414	AA324975	Hs.128993	ESTs; Weakly similar to KIAA0465 protein [H.sapiens]	3.25
312187	AA700439	Hs.188490	ESTs	3.25
334061			CH22_FGENES.327_14	3.23
336036			CH22_FGENES.678_7	3.23
321477	H67818	Hs.222059	ESTs	3.21
315760	AW139383	Hs.245437	ESTs	3.2
316733	AA811713	Hs.163222	ESTs	3.2
300855	AW235248	Hs.79828	ESTs	3.2
323611	AA304986	Hs.145704	ESTs	3.19
314138	AA740616		EST cluster (not in UniGene)	3.17
316774	AA814859		EST cluster (not in UniGene)	3.16
308884	AI833131	Hs.179100	ESTs	3.11
331317	AA258222	Hs.87757	ESTs	3.1
317221	AI989538	Hs.191074	ESTs	3.08
316386	AA749062	Hs.180285	ESTs	3.08
321040	H26953		EST cluster (not in UniGene)	3.08
308828	AI824829		EST singleton (not in UniGene) with exon hit	3.08
300778	AA236233	Hs.188716	ESTs	3.07
316667	AW015940	Hs.232234	ESTs	3.07
324614	AW503101		EST cluster (not in UniGene)	3.07
316468	AW293046	Hs.255158	ESTs	3.07
300671	AI239706	Hs.189886	ESTs	3.06
314301	AW297867	Hs.188181	ESTs	3.05
312335	AW043620	Hs.236993	ESTs	3.03
322957	AA247755		EST cluster (not in UniGene)	3.01
316848	AA830053	Hs.126798	ESTs	3.01
313473	AA009660	Hs.251948	ESTs; Moderately similar to T07D3.7 [C.elegans]	2.99
318518	T27119		EST cluster (not in UniGene)	2.98
313383	AI076370	Hs.134037	ESTs	2.97
331389	AA458637	Hs.152207	ESTs	2.96
304257	AA053294		EST singleton (not in UniGene) with exon hit	2.95
309917	AW340014		EST singleton (not in UniGene) with exon hit	2.95
319861	H08035	Hs.21398	ESTs; Moderately similar to PUTATIVE GLUCOSAMINE-6-PHOSPHATE	

			ISOMERASE [H.sapiens]	2.95
321253	AI699484		EST cluster (not in UniGene)	2.93
321193	AA149508	Hs.103288	ESTs	2.93
332864			CH22_FGENES.28_4	2.92
300027				
	M11507		AFFX control: transferrin receptor	2.91
324330	AA884766		EST cluster (not in UniGene)	2.88
320014	AA137114	Hs.170291	ESTs	2.88
333916			CH22_FGENES.296_5	2.88
318885	Z43272		EST cluster (not in UniGene)	2.87
318146	AI040125	Hs.150521	ESTs	2.87
323348	AA233056	Hs.191518	ESTs	2.85
305703	AA825148	Hs.21229	F-box protein Fbw1b	2.84
335862			CH22_FGENES.629_7	2.83
317672	AW205409	Hs.127748	ESTs	2.82
323416	AI610397	Hs.159560	ESTs	2.81
312652	AI419909	Hs.160994	ESTs	2.81
324094	AA382603		EST cluster (not in UniGene)	2.81
319761	R84237		EST cluster (not in UniGene)	2.8
317013	AA864468	Hs.135646	ESTs	2.8
317383	AA913887	Hs.126511	ESTs	2.78
314659	AW277121	Hs.254881	ESTs	2.78
312479	AI950844	Hs.128738	ESTs; Weakly similar to non-lens beta gamma-crystallin like protein [H.sapiens]	2.77
332808			CH22_FGENES.7_10	2.75
311824	AW293826	Hs.250610	ESTs	2.75
321992	C06003	Hs.116456	ESTs	2.73
316074	AW517542	Hs.208382	ESTs	2.73
309839	AW296076		EST singleton (not in UniGene) with exon hit	2.73
312071	AA683529	Hs.143119	ESTs	2.73
312684	AW294020	Hs.117721	ESTs	2.72
332668	AA062971	Hs.181161	ESTs; Weakly similar to INHIBITOR OF APOPTOSIS PROTEIN 1 [M.musculus]	2.72
322139	H53744		EST cluster (not in UniGene)	2.72
304168	H77679		EST singleton (not in UniGene) with exon hit	2.72
325602			CH.13_hs gi|5866994	2.71
319885	R59096	Hs.136698	ESTs	2.71
300611	N75450		EST cluster (not in UniGene) with exon hit	2.71
316854	AA831215	Hs.159066	ESTs; Weakly similar to predicted using Genefinder [C.elegans]	2.69
318208	AI091458	Hs.134559	ESTs	2.68
331623	R38715	Hs.153529	Homo sapiens clone 24540 mRNA sequence	2.68
324616	AI823999	Hs.162000	ESTs	2.68
304968	AA614308		EST singleton (not in UniGene) with exon hit	2.67
314912	AI431345	Hs.161784	ESTs	2.67
300767	AW193466	Hs.136525	ESTs	2.67
313463	AI057389	Hs.122536	ESTs	2.65
320600	AA135565	Hs.250739	ESTs	2.65
301180	AI308989	Hs.156939	ESTs	2.65
324825	AA704457	Hs.255738	ESTs; Moderately similar to gag [H.sapiens]	2.65
300336	AW292417	Hs.255074	ESTs; Moderately similar to high-risk human papilloma viruses E6 oncoproteins targeted protein E6TP1 alpha [H.sapiens]	2.64
317850	N29974		EST cluster (not in UniGene)	2.64
339047			CH22_DA59H18.GENSCAN.28-7	2.64
324580	AA492588		EST cluster (not in UniGene)	2.63
321142	AI817933	Hs.209584	ESTs	2.62
319478	R06841		EST cluster (not in UniGene)	2.62
300793	AI248571	Hs.166837	ESTs	2.61
313733	AA836116		EST cluster (not in UniGene)	2.6
326505			CH.19_hs gi|5867435	2.6
314987	AW015506	Hs.130730	ESTs	2.6
303114	AF090948		EST cluster (not in UniGene) with exon hit	2.59
318709	H24244	Hs.240763	ESTs; Weakly similar to /prediction	2.58
312878	AI209108	Hs.143946	ESTs	2.57
329224			CH.X_hs gi|5868728	2.56
328018			CH.06_hs gi|5902482	2.56
323231	AA324437	Hs.177230	ESTs	2.55
312887	AW157377	Hs.132910	ESTs	2.55
315183	AW138134	Hs.220277	ESTs	2.55
300259	AI479011	Hs.170783	ESTs	2.54
313240	AI743261	Hs.131860	ESTs	2.54
316697	AW293174	Hs.252627	ESTs	2.53

313966	AI807551	Hs.189061	ESTs	2.53
331263	AA015718		ze31a12.s1 Soares retina N2b4HR Homo sapiens cDNA clone IMAGE:36574 3', mRNA sequence	2.51
310683	AW055233	Hs.160870	ESTs	2.5
302566	AA085996	Hs.248572	Human PAC clone DJ404F18 from Xq23	2.5
302697	AJ001408		EST cluster (not in UniGene) with exon hit	2.5
308362	AI613519		EST singleton (not in UniGene) with exon hit	2.49
322347	AF086538		EST cluster (not in UniGene)	2.49
316240	AA974253	Hs.120319	ESTs	2.49
323208	AA203415	Hs.136200	ESTs	2.48
321643	W76005	Hs.32094	ESTs	2.48
330723	AA243617	Hs.31082	ESTs; Highly similar to db83 [R.norvegicus]	2.48
323455	AA256675	Hs.200438	ESTs; Weakly similar to atypical PKC specific binding protein [R.norvegicus]	2.47
308383	AI624497		EST singleton (not in UniGene) with exon hit	2.47
328744			CH.07_hs gi|5868290	2.47
332344	W45574	Hs.252497	ESTs	2.47
328121			CH.06_hs gi|5868031	2.47
321915	AI670955	Hs.200151	ESTs	2.46
314954	AA521381	Hs.187726	ESTs	2.45
302821	AA188868	Hs.173933	ESTs; Weakly similar to NUCLEAR FACTOR 1/X [H.sapiens]	2.45
329454			CH.Y_hs gi|5868887	2.45
336605			CH22_FGENES.420_4	2.45
300664	AI444628	Hs.256809	ESTs	2.44
323362	AL135067	Hs.117182	ESTs	2.44
300024	M10098		AFFX control: 18S ribosomal RNA	2.44
325026	AI671168	Hs.12285	ESTs	2.43
324510	AI148353	Hs.120849	ESTs	2.43
313389	AI765182	Hs.119903	ESTs	2.43
301309	M78276	Hs.255917	ESTs	2.43
313570	AA041455	Hs.209312	ESTs	2.43
316504	AW135854	Hs.132458	ESTs	2.42
319401	R01342		EST cluster (not in UniGene)	2.42
312827	AI744361	Hs.205591	ESTs; Weakly similar to zinc finger protein Png-1 [M.musculus]	2.42
327871			CH.06_hs gi|5868131	2.41
337173			CH22_FGENES.565-3	2.41
302948	AA465635		EST cluster (not in UniGene) with exon hit	2.41
324303	AL118754		EST cluster (not in UniGene)	2.4
315527	AI791138	Hs.116768	ESTs	2.4
315979	AA830515	Hs.222917	ESTs	2.4
331310	AA253351	Hs.44439	STAT induced STAT inhibitor-4	2.4
321095	AA017595	Hs.32844	ESTs	2.4
308561	AI701559		EST singleton (not in UniGene) with exon hit	2.39
313035	N36417	Hs.144928	ESTs	2.37
322114	AA643791	Hs.191740	ESTs	2.37
313671	W49823	Hs.145553	ESTs	2.37
303211	AA099548	Hs.191436	ESTs; Highly similar to dJ1118D24.4 [H.sapiens]	2.37
301256	AA932948		EST cluster (not in UniGene) with exon hit	2.36
338165			CH22_EM:AC005500.GENSCAN.212-3	2.36
324692	AA557952		EST cluster (not in UniGene)	2.35
318587	AA779704	Hs.168830	ESTs	2.35
312378	R41582	Hs.109219	retinal degeneration B beta	2.35
318625	T48446	Hs.193162	ESTs	2.35
305181	AA663726	Hs.116922	EST	2.35
300815	AA286678		EST cluster (not in UniGene) with exon hit	2.34
324063	AW292740	Hs.254815	ESTs	2.34
315859	AA682305	Hs.133268	ESTs	2.33
305092	AA642912		EST singleton (not in UniGene) with exon hit	2.33
306598	AI000320		EST singleton (not in UniGene) with exon hit	2.33
300307	AI651016	Hs.246311	ESTs	2.33
321348	Z49979		EST cluster (not in UniGene)	2.33
325112	AI903770	Hs.124344	ESTs	2.32
336679			CH22_FGENES.43-7	2.32
321383	AJ002574		EST cluster (not in UniGene)	2.32
337357			CH22_FGENES.730-6	2.31
300680	AW468066	Hs.257712	ESTs; Weakly similar to KIAA0986 protein [H.sapiens]	2.31
327120			CH.21_hs gi|6531970	2.31
302761	AW250553		EST cluster (not in UniGene) with exon hit	2.3
312132	AI475490	Hs.170577	ESTs	2.3
315639	AA827652		EST cluster (not in UniGene)	2.3

312189	T95594	Hs.187435	ESTs	2.3
306537	AA991705		EST singleton (not in UniGene) with exon hit	2.3
327061			CH.21_hs gi|6531965	2.3
315391	AA759098	Hs.192007	ESTs	2.3
322384	AI968646	Hs.33862	ESTs	2.29
323206	AA203339	Hs.220750	ESTs	2.29
318110	AI680915	Hs.201379	ESTs	2.28
335250			CH22_FGENES.516_11	2.28
331696	Z38907	Hs.91662	KIAA0888 protein	2.28
318327	AW294013	Hs.200942	ESTs	2.28
324980	AA969121	Hs.254296	ESTs	2.28
319429	AI608881	Hs.11482	ESTs; Highly similar to junctional adhesion molecule [H.sapiens]	2.28
310601	AI970543	Hs.192605	ESTs	2.28
318905	Z43395		EST cluster (not in UniGene)	2.28
323442	AA252753	Hs.164039	ESTs	2.27
304428	AA342250	Hs.99819	ubiquitin specific protease 16	2.27
313352	AW292127	Hs.144758	ESTs	2.27
316491	AA766025	Hs.238794	EST	2.27
317751	AI697668	Hs.202241	ESTs	2.26
314136	AA229781	Hs.221962	ESTs	2.26
306665	AI004614	Hs.130577	EST	2.26
303946	AW474196	Hs.221604	ESTs	2.25
313435	AA769123		EST cluster (not in UniGene)	2.25
317679	AA968799	Hs.150289	ESTs	2.25
322370	AA330095		EST cluster (not in UniGene)	2.25
306620	AI000929		EST singleton (not in UniGene) with exon hit	2.24
329109			CH.X_hs gi|5868626	2.24
311043	AI871209	Hs.177128	ESTs	2.24
300228	AI458372	Hs.158748	ESTs; Weakly similar to synapsin Ib [M.musculus]	2.24
307223	AI193698	Hs.184776	ribosomal protein L23a	2.24
309023	AI888045		EST singleton (not in UniGene) with exon hit	2.23
310749	AI493675	Hs.170332	ESTs	2.23
316769	AI914939	Hs.212184	ESTs	2.22
320409	AA356195		EST cluster (not in UniGene)	2.21
333149			CH22_FGENES.87_8	2.21
324951	M86125	Hs.137487	ESTs	2.21
321939	AI791617	Hs.145068	ESTs	2.2
320594	AI863952	Hs.169436	arginyltransferase 1	2.2
320722	R67430	Hs.172787	ESTs	2.2
321781	D78667		EST cluster (not in UniGene)	2.2
328903			CH.08_hs gi|5868514	2.2
303889	T19204		EST cluster (not in UniGene) with exon hit	2.2
325045	T08845		EST cluster (not in UniGene)	2.2
312828	AI865455	Hs.211818	ESTs; Moderately similar to !!!! ALU SUBFAMILY J WARNING ENTRY !!!! [H.sapiens]	2.19
335109			CH22_FGENES.494_15	2.18
330878	AA131471	Hs.71440	ESTs	2.18
311289	AI971362	Hs.231945	ESTs	2.18
304608	AA513456		EST singleton (not in UniGene) with exon hit	2.18
337393			CH22_FGENES.747-4	2.18
332812			CH22_FGENES.7_14	2.18
327665			CH.04_hs gi|5867839	2.18
314581	AW504859	Hs.237849	ESTs	2.17
326508			CH.19_hs gi|6682496	2.17
301242	AW161535	Hs.258803	ESTs	2.17
312780	AI765651	Hs.172900	ESTs	2.17
315954	AW276810	Hs.254859	ESTs	2.16
311179	AI880843	Hs.223333	ESTs	2.16
315320	AI084182	Hs.186895	ESTs	2.16
313017	AI015203	Hs.118015	ESTs	2.16
312430	AW139117	Hs.117494	ESTs	2.15
300864	AA406539	Hs.190958	ESTs	2.15
314753	AA463262		EST cluster (not in UniGene)	2.15
322574	AF156548		EST cluster (not in UniGene)	2.15
321409	C03864		EST cluster (not in UniGene)	2.15
321205	AA002047		EST cluster (not in UniGene).	2.14
320406	AA353895	Hs.152983	HUS1 (S. pombe) checkpoint homolog	2.14
337646			CH22_EM:AC000097.GENSCAN.11-2	2.13
303084	AF174008		EST cluster (not in UniGene) with exon hit	2.13
312185	AA654772	Hs.186564	ESTs	2.13

306813	AI066544		EST singleton (not in UniGene) with exon hit	2.13
314465	AA602917	Hs.156974	ESTs	2.12
318168	AI821782	Hs.220587	ESTs; Moderately similar to !!!! ALU SUBFAMILY SC WARNING ENTRY !!!! [H.sapiens]	2.12
315990	AI800041	Hs.190555	ESTs	2.11
320712	R66867		EST cluster (not in UniGene)	2.11
318487	AI167877	Hs.143716	ESTs	2.11
317462	AW015206	Hs.178784	ESTs	2.11
304384	AA235482	Hs.62954	ferritin; heavy polypeptide 1	2.11
314544	AA399018	Hs.250835	ESTs	2.1
319881	T72744		EST cluster (not in UniGene)	2.1
328078			CH.06_hs gi|5868008	2.1
317354	AW090770	Hs.192271	ESTs	2.1
308617	AI738720		EST singleton (not in UniGene) with exon hit	2.09
311568	AW439969	Hs.218177	ESTs	2.09
313605	AI761786	Hs.204674	ESTs	2.09
314289	AA848118	Hs.221216	ESTs	2.08
332933			CH22_FGENES.38_7	2.08
325498			CH.12_hs gi|5866967	2.08
313659	AW296067	Hs.124106	ESTs	2.08
324596	AW149321	Hs.105411	ESTs	2.08
324783	AA640770		EST cluster (not in UniGene)	2.07
302696	AA347452		EST cluster (not in UniGene) with exon hit	2.07
313418	AW450674	Hs.114696	ESTs	2.06
326920			CH.21_hs gi|6456782	2.06
327574			CH.03_hs gi|5867818	2.06
323207	AI052795	Hs.192201	ESTs	2.06
303753	AW503733	Hs.170315	ESTs	2.05
305235	AA670480		EST singleton (not in UniGene) with exon hit	2.05
316055	AA693880		EST cluster (not in UniGene)	2.05
317194	AW445167	Hs.126036	ESTs	2.05
319565	AW408683	Hs.32922	ESTs	2.05
335146			CH22_FGENES.499_2	2.05
301475	AI678183	Hs.170917	prostaglandin E receptor 3 (subtype EP3)	2.04
312442	AA120970	Hs.143199	ESTs	2.04
322502	R62925	Hs.243665	ESTs	2.04
303693	AA290875	Hs.30120	ESTs	2.04
310179	AI215643	Hs.171381	ESTs	2.03
321121	W23285		EST cluster (not in UniGene)	2.03
331330	AA282197	Hs.89002	ESTs; Highly similar to CGI-07 protein [H.sapiens]	2.03
306557	AA994530		EST singleton (not in UniGene) with exon hit	2.03
317865	AI298794	Hs.129130	ESTs	2.03
318667	AI493742	Hs.165210	ESTs	2.02
318042	AW294522	Hs.149991	ESTs	2.02
323818	AW245528	Hs.134754	ESTs	2.02
331286	AA137062	Hs.103853	ESTs	2.01
311262	AI989942	Hs.232150	ESTs	2.01
335601			CH22_FGENES.581_41	2.01
311351	AI682303	Hs.201274	ESTs	2.01
312996	AA249018		EST cluster (not in UniGene)	2.01
328190			CH.06_hs gi|5868077	2
338030			CH22_EM:AC005500.GENSCAN.148-16	2
333940			CH22_FGENES.301_6	2
328227			CH.06_hs gi|5868105	2
331481	N27448	Hs.43944	EST	2
335288			CH22_FGENES.527_1	2
307513	AI274307		EST singleton (not in UniGene) with exon hit	2
323316	AL134620		EST cluster (not in UniGene)	2
319479	R21945	Hs.256153	ESTs	2
303482	AA502583	Hs.197271	ESTs	2
327489			CH.02_hs gi|6004459	1.99
323935	AW175841	Hs.192183	ESTs	1.99
309575	AW168096	Hs.195188	glyceraldehyde-3-phosphate dehydrogenase	1.99
337043			CH22_FGENES.439-19	1.98
312897	AI828174	Hs.227049	ESTs	1.98
307881	AI370434		EST singleton (not in UniGene) with exon hit	1.98
328656			CH.07_hs gi|6004473	1.98
314569	AA813784	Hs.123001	ESTs	1.98
332783	W45302	Hs.87889	helicase-moi	1.98
315259	AA701499	Hs.148115	ESTs	1.98

313171	N67879	Hs.157695	ESTs	1.97
318060	AI241421	Hs.132236	ESTs	1.97
332256	N66393	Hs.102754	ESTs	1.97
312110	AI962180	Hs.226803	ESTs	1.97
335864			CH22_FGENES.629_9	1.97
320389	W00545	Hs.171785	ESTs	1.97
314065	AA868267	Hs.85524	ESTs	1.96
323086	H15474	Hs.12214	Homo sapiens clone 23716 mRNA sequence	1.96
323919	AA862973	Hs.220704	ESTs	1.96
310750	AI373163	Hs.170333	ESTs	1.96
309435	AW090537		EST singleton (not in UniGene) with exon hit	1.96
300129	AW028820		EST cluster (not in UniGene) with exon hit	1.96
320130	AI820675	Hs.203804	ESTs	1.95
323787	AW373446	Hs.169885	ESTs; Weakly similar to cDNA EST EMBL:T02216 comes from this gene [C.elegans]	1.95
338112			CH22_EM:AC005500.GENSCAN.185-24	1.95
313625	AW468402	Hs.254020	ESTs	1.95
325240			CH.10_hs gi|5866848	1.95
331833	AA412102	Hs.250911	interleukin 13 receptor; alpha 1	1.95
332252	N63882		za21f9.s1 Soares fetal liver spleen 1NFLS Homo sapiens cDNA clone IMAGE:293225 3', mRNA sequence	1.95
300279	AW237425	Hs.253817	ESTs	1.95
326023			CH.17_hs gi|5867245	1.95
321609	H86021	Hs.198800	ESTs; Weakly similar to hMmTRA1b [H.sapiens]	1.94
324183	AA402453	Hs.113011	ESTs	1.94
336276			CH22_FGENES.762_5	1.94
334913			CH22_FGENES.456_3	1.94
325417			CH.12_hs gi|5866925	1.94
318489	AW043590	Hs.225023	ESTs	1.94
318455	AI148763		EST cluster (not in UniGene)	1.94
306890	AI092235		EST singleton (not in UniGene) with exon hit	1.94
315073	AW452948	Hs.257631	ESTs	1.94
321289	R84687	Hs.226306	ESTs	1.94
308521	AI689808		EST singleton (not in UniGene) with exon hit	1.93
306382	AA968967		EST singleton (not in UniGene) with exon hit	1.93
331320	AA262999	Hs.42788	ESTs	1.93
324279	AA501412	Hs.191688	ESTs; Weakly similar to Pro-Pol-dUTPase polyprotein [M.musculus]	1.93
309577	AW168753		EST singleton (not in UniGene) with exon hit	1.93
327014			CH.21_hs gi|5867664	1.93
303488	AW025860		EST cluster (not in UniGene) with exon hit	1.93
306561	AA995223	Hs.129559	EST	1.92
330694	AA019806	Hs.108447	spinocerebellar ataxia 7 (olivopontocerebellar atrophy with retinal degeneration)	1.92
313083	N50545	Hs.159200	ESTs	1.92
327752			CH.05_hs gi|5867949	1.92
318674	AA295490		EST cluster (not in UniGene)	1.92
301267	AW297762	Hs.255690	ESTs	1.91
332092	AA608787	Hs.112590	ESTs	1.91
323509	AL036947		EST cluster (not in UniGene)	1.91
321452	AA317554		EST cluster (not in UniGene)	1.91
311483	AI765013	Hs.209128	ESTs	1.91
300976	AI246374	Hs.185861	ESTs	1.91
323715	AA322155		EST cluster (not in UniGene)	1.91
313800	AW296132	Hs.166674	ESTs	1.91
332029	AA489697	Hs.145053	ESTs	1.91
304013	AW518573	Hs.156110	Immunoglobulin kappa variable 1D-8	1.91
322019	AA354549	Hs.41181	Homo sapiens mRNA; cDNA DKFZp727C191 (from clone DKFZp727C191)	1.91
334150			CH22_FGENES.339_1	1.9
310094	AW450967	Hs.235240	ESTs	1.9
316218	AW207642	Hs.174021	ESTs	1.9
324774	AI031771	Hs.132586	ESTs	1.9
326507			CH.19_hs gi|5867435	1.9
314570	AA405696		EST cluster (not in UniGene)	1.9
336268			CH22_FGENES.758_2	1.9
315278	AI985544	Hs.116429	ESTs	1.9
325824			CH.15_hs gi|5867048	1.9
316277	AA737780	Hs.213392	ESTs	1.9
323181	AA418583	Hs.143621	ESTs	1.9
301438	AA961643	Hs.127716	ESTs	1.89
307050	AI147341	Hs.146734	EST	1.89
306830	AI075803		EST singleton (not in UniGene) with exon hit	1.89

302426	AL049925	Hs.225984	DKFZP547G0910 protein	1.89
320127	H72615	Hs.17268	ESTs	1.89
337736			CH22_EM:AC000097.GENSCAN.100-2	1.89
331319	AA262755	Hs.194264	ESTs	1.88
310767	AI377505	Hs.158835	ESTs	1.88
314880	AI732169	Hs.105429	ESTs	1.88
312539	AI004377	Hs.200360	ESTs	1.88
309674	AW205604	Hs.168034	ESTs; Weakly similar to !!!! ALU SUBFAMILY SP WARNING ENTRY !!!! [H.sapiens]	1.88
314621	AI627478	Hs.187670	ESTs	1.88
319495	AI972146	Hs.192756	ESTs	1.88
313472	AA007374		EST cluster (not in UniGene)	1.88
302705	U09060		EST cluster (not in UniGene) with exon hit	1.88
329511			CH.10_p2 gi|3983514	1.88
317140	AI699412	Hs.201925	ESTs	1.87
302598	AI815985	Hs.129683	ubiquitin-conjugating enzyme E2D 1 (homologous to yeast UBC4/5)	1.87
301153	AA725670	Hs.120485	ESTs; Weakly similar to serine/threonine kinase with SH3 domain; leucine zipper domain and proline rich domain [H.sapiens]	1.87
332222	N28271	Hs.176818	ESTs	1.87
330703	AA055475	Hs.104143	clathrin; light polypeptide (Lca)	1.87
318470	AI159863	Hs.143713	ESTs	1.87
314014	AW291847	Hs.121715	ESTs; Weakly similar to HP protein [H.sapiens]	1.87
300370	AI827817		EST cluster (not in UniGene) with exon hit	1.86
312329	R84768	Hs.13399	Homo sapiens clone 25032 mRNA sequence	1.86
325587			CH.12_hs gi|6682462	1.86
310237	AI884313	Hs.158906	ESTs	1.86
318872	R13085		EST cluster (not in UniGene)	1.86
303431	AA317915		EST cluster (not in UniGene) with exon hit	1.86
338427			CH22_EM:AC005500.GENSCAN.349-1	1.86
300452	AI352293	Hs.191098	ESTs	1.85
321279	H85330	Hs.146060	ESTs	1.85
301690	F05865	Hs.249180	ubiquitin-conjugating enzyme E2E 2 (homologous to yeast UBC4/5)	1.85
307932	AJ230822		EST singleton (not in UniGene) with exon hit	1.85
318292	AI679966	Hs.150603	ESTs	1.85
310254	AI239811	Hs.157491	ESTs	1.85
311790	AW016437	Hs.233462	ESTs	1.84
314248	AA278347	Hs.126078	ESTs	1.84
335586			CH22_FGENES.581_25	1.84
339209			CH22_FF113D11.GENSCAN.6-4	1.84
307954	AI419692		EST singleton (not in UniGene) with exon hit	1.84
302549	AF055136	Hs.248162	tectorin alpha	1.84
321629	H87213	Hs.158092	ESTs	1.84
301239	AA807558		EST cluster (not in UniGene) with exon hit	1.84
332434	N75542	Hs.75356	transcription factor 4	1.84
327192			CH.01_hs gi|5867445	1.83
310214	AI220072	Hs.165893	ESTs	1.83
320516	R33857	Hs.181479	ESTs; Weakly similar to E-SELECTIN PRECURSOR [H.sapiens]	1.83
324231	W60827		EST cluster (not in UniGene)	1.83
336616			CH22_FGENES.613_5	1.83
328799			CH.07_hs gi|5868316	1.83
324661	AW504161		EST cluster (not in UniGene)	1.83
313190	AA766707	Hs.153039	ESTs	1.83
301979	L28168	Hs.121495	potassium voltage-gated channel; Isk-related family; member 1	1.82
302099	AL021397	Hs.137576	ribosomal protein L34 pseudogene 1	1.82
320187	T99949		EST cluster (not in UniGene)	1.82
320791	R78808	Hs.93961	ESTs; Weakly similar to !!!! ALU CLASS A WARNING ENTRY !!!! [H.sapiens]	1.82
305733	AA829535	Hs.84298	CD74 antigen (invariant polypept of MHC; class II antigen-associated)	1.82
308280	AI569349	Hs.180920	ribosomal protein S9	1.81
321533	W78877	Hs.40111	ESTs	1.81
312946	AI915122	Hs.204087	ESTs; Weakly similar to F33D11.9b [C.elegans]	1.81
319474	H90265	Hs.100636	ESTs	1.81
329519			CH.10_p2 gi|3983510	1.81
324685	AA220982		EST cluster (not in UniGene)	1.81
320697	N62937	Hs.139181	ESTs	1.81
329246			CH.X_hs gi|5868732	1.81
332000	AA481271	Hs.193945	ESTs	1.81
310811	AI420990	Hs.161303	ESTs	1.81
325866			CH.16_hs gi|5867076	1.81
322064	Z78343		EST cluster (not in UniGene)	1.8
333712			CH22_FGENES.251_1	1.8

313457	AA576052	Hs.193223	ESTs	1.8
321591	H85687	Hs.117927	ESTs	1.8
330260			CH.05_p2 gi|6671884	1.8
311080	AI656320	Hs.197711	ESTs	1.8
329522			CH.10_p2 gi|3983507	1.8
322889	AA081924	Hs.211417	ESTs	1.8
300175	AI275011	Hs.204877	ESTs	1.8
330976	H20560	Hs.244624	ESTs	1.8
300208	AI341180	Hs.196115	ESTs; Weakly similar to FIBRILLIN 1 PRECURSOR [H.sapiens]	1.79
319635	R17531		EST cluster (not in UniGene)	1.79
313454	AA730673	Hs.188634	ESTs	1.79
303093	AI400310	Hs.148958	ESTs	1.79
309815	AW292760		EST singleton (not in UniGene) with exon hit	1.79
326506			CH.19_hs gi|5867435	1.79
319845	AA649011	Hs.187902	ESTs	1.79
300290	AI623739	Hs.186387	ESTs	1.79
312180	AI248285	Hs.118348	ESTs	1.79
313058	D81015	Hs.125382	ESTs	1.79
330120			CH.19_p2 gi|6671864	1.78
328412			CH.07_hs gi|5868405	1.78
302345	NM_000565		EST cluster (not in UniGene) with exon hit	1.78
308100	AI475949		EST singleton (not in UniGene) with exon hit	1.78
311386	AW205705	Hs.207514	ESTs	1.78
330282			CH.05_p2 gi|6671910	1.78
318856	Z43011	Hs.21169	ESTs	1.78
312486	AA845630	Hs.117904	ESTs	1.78
325450			CH.12_hs gi|5866941	1.78
321206	H54178	Hs.226469	ESTs	1.78
330977	H20826	Hs.31783	ESTs	1.78
303487	AA333666		EST cluster (not in UniGene) with exon hit	1.77
310398	AI264671	Hs.164166	ESTs	1.77
313230	AI540166	Hs.129563	ESTs	1.77
317747	AI683782	Hs.128245	ESTs	1.77
303381	AL038841	Hs.163313	ESTs; Weakly similar to !!!! ALU SUBFAMILY SB WARNING ENTRY !!!! [H.sapiens]	1.77
336123			CH22_FGENES.701_8	1.77
300185	AI286182	Hs.208484	ESTs	1.77
316002	AW451733	Hs.119824	ESTs	1.77
319850	AA001811	Hs.83722	ESTs	1.77
329941			CH.16_p2 gi|6165199	1.77
328329			CH.07_hs gi|5868375	1.77
322934	AI493054	Hs.158968	ESTs	1.77
325902			CH.16_hs gi|5867101	1.76
322239	W01813	Hs.12109	WD40 protein Ciao1	1.76
303530	AI274851	Hs.258744	ESTs	1.76
300980	AI025527	Hs.222097	ESTs	1.76
331909	AA437300	Hs.178210	ESTs	1.76
321553	H92449	Hs.116406	ESTs	1.76
301618	T52760		EST cluster (not in UniGene) with exon hit	1.76
319592	AA627356	Hs.163315	ESTs	1.76
318511	T26528	Hs.227175	ESTs; Weakly similar to !!!! ALU SUBFAMILY SQ WARNING ENTRY !!!! [H.sapiens]	1.76
327183			CH.01_hs gi|5867442	1.76
313516	AA029058	Hs.135145	ESTs	1.76
318644	AI752482		EST cluster (not in UniGene)	1.76
321632	AA419617		EST cluster (not in UniGene)	1.76
324657	AW451142	Hs.255628	ESTs	1.76
300437	AW449374	Hs.257149	ESTs	1.75
319775	AA504429	Hs.6211	methyl-CpG binding domain protein 1	1.75
314775	AI149880	Hs.188809	ESTs	1.75
337460			CH22_FGENES.780-5	1.75
309849	AW297444		EST singleton (not in UniGene) with exon hit	1.75
301471	AA995014	Hs.129544	ESTs; Weakly similar to ORF YLL027w [S.cerevisiae]	1.75
312739	AI318426	Hs.155925	ESTs	1.75
319995	H15355	Hs.60887	ESTs	1.75
326495			CH.19_hs gi|5867423	1.75
337497			CH22_FGENES.801-4	1.75
322633	AA004534	Hs.153981	ESTs	1.75
332177	F10812	Hs.101433	ESTs	1.75
326930			CH.21_hs gi|6456782	1.75
316893	AA837332		EST cluster (not in UniGene)	1.75

324826	AA704806	Hs.143842	ESTs	1.75
311269	AI656924	Hs.174257	ESTs	1.75
309375	AW075342		EST singleton (not in UniGene) with exon hit	1.75
314171	AI821895	Hs.193481	ESTs	1.75
311684	AI990741	Hs.252809	ESTs	1.75
334387			CH22_FGENES.380_1	1.75
312195	AI300101	Hs.252222	ESTs	1.75
315707	AI418055	Hs.161160	ESTs	1.74
324349	AW501470		EST cluster (not in UniGene)	1.74
300724	AI762929	Hs.206134	ESTs; Weakly similar to similar to reverse transcriptase [C.elegans]	1.74
309906	AW339340		EST singleton (not in UniGene) with exon hit	1.74
303714	AW501336		EST cluster (not in UniGene) with exon hit	1.74
318704	Z24981		EST cluster (not in UniGene)	1.74
303027	AF111178		EST cluster (not in UniGene) with exon hit	1.74
322601	W92924		EST cluster (not in UniGene)	1.74
319382	H93199	Hs.33665	ESTs	1.74
315858	AA737345		EST cluster (not in UniGene)	1.74
332243	N55484	Hs.220540	ESTs; Highly similar to ARYL HYDROCARBON RECEPTOR NUCLEAR TRANSLOCATOR [H.sapiens]	1.74
330951	H02566	Hs.191268	Homo sapiens mRNA; cDNA DKFZp434N174 (from clone DKFZp434N174)	1.74
324044	AL045752	Hs.211519	ESTs	1.73
320630	AA199847		EST cluster (not in UniGene)	1.73
327288			CH.01_hs gi|5867481	1.73
314986	AI201367	Hs.142860	ESTs	1.73
319078	H17255	Hs.144515	ESTs	1.73
326278			CH.17_hs gi|5867269	1.73
302552	H49792		EST cluster (not in UniGene) with exon hit	1.73
322322	AF086431		EST cluster (not in UniGene)	1.73
327075			CH.21_hs gi|6531965	1.73
317392	AI797588	Hs.145459	ESTs	1.73
300810	AI076890	Hs.186949	ESTs	1.73
315978	AA830893	Hs.119769	ESTs	1.73
323903	AA773580	Hs.193598	ESTs	1.73
330803	AA004699	Hs.150580	putative translation initiation factor	1.73
309845	AW296802	Hs.255580	EST	1.73
314963	AI689617	Hs.200934	ESTs	1.73
311710	F09774	Hs.175971	ESTs	1.73
315315	AI984592	Hs.15088	ESTs	1.73
300378	AA663560	Hs.235873	ESTs; Weakly similar to K11C4.2 [C.elegans]	1.73
316141	AW303457		EST cluster (not in UniGene)	1.72
319826	T71739	Hs.75442	albumin	1.72
312961	AI033922	Hs.122517	ESTs	1.72
334379			CH22_FGENES.379_11	1.72
305854	AA862733		EST singleton (not in UniGene) with exon hit	1.72
313031	N34927	Hs.186566	ESTs	1.72
329728			CH.14_p2 gi|6065785	1.72
312090	N57692	Hs.118064	ESTs	1.72
323341	AL134875	Hs.192386	ESTs	1.72
302077	AA310580	Hs.132898	Homo sapiens chromosome 11; BAC CIT-HSP-311e8 (BC269730) containing the hFEN1 gene	1.71
310766	AI971438	Hs.158824	ESTs	1.71
311450	AI809985	Hs.203340	ESTs	1.71
311792	AW238064	Hs.253909	ESTs	1.71
321500	H71999		EST cluster (not in UniGene)	1.71
311948	T78791	Hs.241569	ESTs; Moderately smlr to !!!! ALU SUBFAMILY SQ WARNING ENTRY !!!! [H.sapiens]	1.71
302270	R56151		EST cluster (not in UniGene) with exon hit	1.71
329089			CH.X_hs gi|5868614	1.71
322331	AF086487		EST cluster (not in UniGene)	1.71
318235	AI080361	Hs.134217	ESTs	1.71
304561	AA489792		EST singleton (not in UniGene) with exon hit	1.71
312681	AI028149	Hs.193124	pyruvate dehydrogenase kinase; isoenzyme 3	1.71
310250	AI478629	Hs.158465	ESTs	1.71
338178			CH22_EM:AC005500.GENSCAN.219-6	1.71
338910			CH22_DJ32I10.GENSCAN.11-2	1.71
321225	AL080073	Hs.251414	Homo sapiens mRNA; cDNA DKFZp564B1462 (from clone DKFZp564B1462)	1.7
322289	AA534550	Hs.539	ribosomal protein S29	1.7
319802	AI701489	Hs.202501	ESTs	1.7
314022	AW452420	Hs.248678	ESTs	1.7
314937	AA515602	Hs.152330	ESTs	1.7

300580	AA761322	Hs.220538	ESTs	1.7
304398	AA262785		EST singleton (not in UniGene) with exon hit	1.7
313421	AW339515	Hs.163700	ESTs	1.7
309763	AW270182		EST singleton (not in UniGene) with exon hit	1.7
322092	AF085833		EST cluster (not in UniGene)	1.7
315603	AA764768	Hs.121158	ESTs	1.7
325031	T08597		EST cluster (not in UniGene)	1.7
327157			CH.01_hs gi|5866841	1.7
314809	AI741461	Hs.161904	ESTs	1.7
320361	H67220	Hs.146406	nitrilase 1	1.69
324721	AW402302	Hs.43616	ESTs	1.69
328624			CH.07_hs gi|5868246	1.69
303344	AA255977	Hs.250646	ESTs; Highly similar to ubiquitin-conjugating enzyme [M.musculus]	1.69
328960			CH.08_hs gi|8456775	1.69
315702	AA657501	Hs.146315	ESTs	1.69
302385	AJ224172	Hs.204096	lipophilin B (uteroglobin family member); prostatein-like	1.68
319699	R14537		EST cluster (not in UniGene)	1.68
309506	AW137700		EST singleton (not in UniGene) with exon hit	1.68
330417	D84424	Hs.57697	hyaluronan synthase 1	1.68
315296	AA876905	Hs.125286	ESTs	1.68
328538			CH.07_hs gi|5868485	1.68
323923	AA354146		EST cluster (not in UniGene)	1.68
320303	AL079289	Hs.137154	Homo sapiens mRNA full length insert cDNA clone EUROIMAGE 35971	1.68
302967	AI927068	Hs.110853	ESTs; Weakly similar to R10D12.12 [C.elegans]	1.68
310695	AI472124	Hs.157757	ESTs	1.68
307512	AI273815	Hs.242463	keratin 8	1.68
338506			CH22_EM:AC005500.GENSCAN.390-10	1.68
331722	AA195405	Hs.110347	Homo sapiens mRNA for alpha integrin binding protein 80; partial	1.68
301431	R05385		EST cluster (not in UniGene) with exon hit	1.68
318853	Z42977	Hs.21062	ESTs	1.68
323032	AW244073	Hs.145946	ESTs	1.68
317538	AW137772	Hs.185980	ESTs	1.68
325780			CH.14_hs gi|6381953	1.67
321739	AL080280		EST cluster (not in UniGene)	1.67
319808	T58960		EST cluster (not in UniGene)	1.67
313443	AA249037		EST cluster (not in UniGene)	1.67
331366	AA424754	Hs.43149	ESTs	1.67
316443	AI797592	Hs.207407	ESTs	1.67
322878	AA081820		EST cluster (not in UniGene)	1.67
330320			CH.08_p2 gi|5932415	1.67
329081			CH.X_hs gi|5868602	1.67
334026			CH22_FGENES.318_3	1.67
317791	AI801500	Hs.128457	ESTs	1.67
322235	AF086106		EST cluster (not in UniGene)	1.66
331148	R73816	Hs.17385	ESTs	1.66
325452			CH.12_hs gi|5866941	1.66
315106	AW452184	Hs.232100	ESTs	1.66
326014			CH.16_hs gi|5867160	1.66
307130	AI185234		EST singleton (not in UniGene) with exon hit	1.66
300943	AA524545	Hs.224630	ESTs	1.66
319402	W21298		EST cluster (not in UniGene)	1.66
310889	AI457946	Hs.170437	ESTs; Weakly similar to hyperpolarization-activated; cyclic nucleotide-gated channel 2 [H.sapiens]	1.66
323371	AL135118		EST cluster (not in UniGene)	1.66
335568			CH22_FGENES.581_4	1.66
320654	AW263086	Hs.118112	ESTs	1.66
338983			CH22_DA59H18.GENSCAN.3-1	1.65
330002			CH.16_p2 gi|6623963	1.65
315343	AW205477	Hs.179891	ESTs	1.65
334487			CH22_FGENES.395_9	1.65
312169	AI064824	Hs.193385	ESTs	1.65
309668	AW204480	Hs.253414	EST	1.65
309518	AW148928	Hs.248895	EST	1.65
307965	AI421641		EST singleton (not in UniGene) with exon hit	1.65
316787	AW369770	Hs.130351	ESTs	1.65
300835	AA401858	Hs.224843	ESTs	1.65
338763			CH22_EM:AC005500.GENSCAN.517-16	1.65
303327	AA232729	Hs.154302	ESTs	1.65
313231	AW139993	Hs.163682	ESTs	1.65

334073			CH22_FGENES.327_28	1.65
319901	T77136	Hs.8765	RNA helicase-related protein	1.65
326530			CH.19_hs gi|5867441	1.65
301126	AI802877	Hs.210843	ESTs; Weakly similar to dJ1039K5.2 [H.sapiens]	1.65
314043	AA827082		EST cluster (not in UniGene)	1.65
304387	AA236027		EST singleton (not in UniGene) with exon hit	1.65
322932	AA099732		EST cluster (not in UniGene)	1.65
337272			CH22_FGENES.660-1	1.64
332694	AA262768	Hs.243901	KIAA1067 protein	1.64
318996	Z44266		EST cluster (not in UniGene)	1.64
315336	AW342028	Hs.256112	ESTs	1.64
313329	AW293704	Hs.122658	ESTs	1.64
318088	AW295409	Hs.137945	ESTs	1.64
313835	AI538438	Hs.159087	ESTs	1.64
320035	AA378974	Hs.130720	ESTs; Weakly similar to CELLULAR NUCLEIC ACID BINDING PROTEIN [H.sapiens]	1.64
309372	AW074330		EST singleton (not in UniGene) with exon hit	1.63
324157	AW402236		EST cluster (not in UniGene)	1.63
323929	AA354940	Hs.145958	ESTs	1.63
302490	AA885502	Hs.187032	ESTs	1.63
333942			CH22_FGENES.301_8	1.63
327469			CH.02_hs gi|5867772	1.63
301918	AA476777		EST cluster (not in UniGene) with exon hit	1.63
315664	AI744068	Hs.160712	ESTs	1.63
304405	AA282572		EST singleton (not in UniGene) with exon hit	1.63
310624	AI341594	Hs.157522	ESTs; Moderately similar to env protein [H.sapiens]	1.63
319250	F11623		EST cluster (not in UniGene)	1.63
310608	AI982234	Hs.196102	ESTs	1.63
317348	AI348076	Hs.831	3-hydroxymethyl-3-methylglutaryl-Coenzyme A lyase (hydroxymethylglutaricaciduria)	1.63
306513	AA989230		EST singleton (not in UniGene) with exon hit	1.63
320807	AA086110	Hs.188536	Homo sapiens clone 24838 mRNA sequence	1.63
303710	AI269069	Hs.250852	ESTs; Highly similar to ubiquitin hydrolyzing enzyme I [H.sapiens]	1.63
328291			CH.07_hs gi|5868363	1.63
304236	W93278		EST singleton (not in UniGene) with exon hit	1.63
317683	AI791700	Hs.127893	ESTs	1.63
311960	AW440133	Hs.189690	ESTs	1.62
312834	AI028309	Hs.114246	ESTs	1.62
325326			CH.11_hs gi|5866875	1.62
313663	AI953261	Hs.169813	ESTs	1.62
327526			CH.02_hs gi|6381882	1.62
300429	AW449679	Hs.156739	ESTs; Highly similar to XG GLYCOPROTEIN PRECURSOR [H.sapiens]	1.62
305169	AA663131		EST singleton (not in UniGene) with exon hit	1.62
316621	AI021996	Hs.122138	ESTs	1.62
329666			CH.14_p2 gi|6272129	1.62
318035	AI744130	Hs.131201	ESTs	1.62
300492	AL031709		multiple UniGene matches	1.62
316532	AI307229	Hs.184304	ESTs	1.62
332048	AA496019	Hs.201591	ESTs	1.62
307113	AI183686		EST singleton (not in UniGene) with exon hit	1.62
319127	N49476		EST cluster (not in UniGene)	1.62
331155	R87650	Hs.33439	ESTs; Weakly similar to !!!! ALU SUBFAMILY J WARNING ENTRY !!!! [H.sapiens]	1.61
338220			CH22_EM:AC005500.GENSCAN.246-9	1.61
315763	AW515270	Hs.118342	ESTs	1.61
323571	AA984133	Hs.153260	c-Cbl-interacting protein	1.61
312240	R28628	Hs.203669	ESTs	1.61
304569	AA490934		EST singleton (not in UniGene) with exon hit	1.61
313179	AI076101	Hs.131704	ESTs	1.61
326858			CH.20_hs gi|6552462	1.61
317276	AI823847	Hs.129986	ESTs	1.61
312572	AA350125	Hs.187499	ESTs	1.61
311932	AW451654	Hs.257482	ESTs	1.61
302103	AA452310	Hs.26090	ESTs; Weakly similar to T20B12.1 [C.elegans]	1.61
308413	AI638253	Hs.196511	EST	1.61
310077	AI620617	Hs.148565	ESTs	1.61
337780			CH22_EM:AC000097.GENSCAN.121-2	1.61
327796			CH.05_hs gi|5867982	1.61
308352	AI610791		EST singleton (not in UniGene) with exon hit	1.61
324539	AI378032	Hs.125892	ESTs	1.61
303232	AA437414		EST cluster (not in UniGene) with exon hit	1.61
337884			CH22_EM:AC005500.GENSCAN.54-2	1.61

303620	AA397546	Hs.119151	ESTs	1.61
303481	AA336839		EST cluster (not in UniGene) with exon hit	1.61
314481	AA548589	Hs.105846	ESTs	1.61
300327	AI908894	Hs.245893	ESTs	1.6
323473	AA262442		EST cluster (not in UniGene)	1.6
326154			CH.17_hs gi|5867170	1.6
331920	AA446885	Hs.99087	ESTs; Moderately similar to ZINC FINGER PROTEIN 141 [H.sapiens]	1.6
323827	AW406878		EST cluster (not in UniGene)	1.6
322452	W56710		EST cluster (not in UniGene)	1.6
310597	AI739071	Hs.158515	ESTs	1.6
307871	AI368665		EST singleton (not in UniGene) with exon hit	1.6
322215	AF088005		EST cluster (not in UniGene)	1.6
318420	AI139857	Hs.143837	ESTs	1.6
332217	H98987	Hs.102383	EST	1.6
324937	M79230	Hs.192398	ESTs	1.6
320543	AF052176	Hs.158529	Homo sapiens clone 24457 mRNA sequence	1.6
300674	AW467388		EST cluster (not in UniGene) with exon hit	1.6
315193	AI241331	Hs.131765	ESTs	1.6
319713	R24204		EST cluster (not in UniGene)	1.6
301210	AI379982	Hs.158944	ESTs	1.6
309365	AW072861		EST singleton (not in UniGene) with exon hit	1.6
321403	AW451454	Hs.247568	adenylate kinase 3	1.6
321908	AA376936	Hs.20998	ESTs	1.6
303349	AA382681		EST cluster (not in UniGene) with exon hit	1.6
324338	AL138357	Hs.247514	ESTs	1.6
310599	AW300144		EST cluster (not in UniGene)	1.6
333193			CH22_FGENES.98_15	1.6
336433			CH22_FGENES.825_12	1.6
312097	AI352096	Hs.157169	ESTs	1.6
311445	AW204237	Hs.192703	ESTs; Weakly similar to !!!! ALU SUBFAMILY J WARNING ENTRY !!!! [H.sapiens]	1.59
317736	AI361722	Hs.192410	ESTs	1.59
308147	AI498991		EST singleton (not in UniGene) with exon hit	1.59
313489	AA017492	Hs.135655	ESTs	1.59
316289	AA902488	Hs.122952	ESTs	1.59
326983			CH.21_hs gi|5867657	1.59
314781	AW205298	Hs.202372	ESTs	1.59
328397			CH.07_hs gi|5868397	1.59
331970	AA461084	Hs.187677	ESTs	1.59
321744	N91419	Hs.12028	ESTs	1.59
310509	AI292181	Hs.150036	ESTs	1.59
315921	AI147545	Hs.114172	ESTs	1.59
322049	AI928242	Hs.144383	ESTs	1.59
301161	AA731518		EST cluster (not in UniGene) with exon hit	1.59
300548	AI026836	Hs.114689	ESTs	1.59
319142	F07366		EST cluster (not in UniGene)	1.59
313526	AW152263	Hs.249243	ESTs	1.59
305937	AA883238		EST singleton (not in UniGene) with exon hit	1.58
330123			CH.19_p2 gi|6671869	1.58
327819			CH.05_hs gi|5867968	1.58
318250	AI478814	Hs.134603	ESTs	1.58
306760	AI034094	Hs.169476	tubulin; alpha; ubiquitous	1.58
322358	AA220235	Hs.246836	ESTs	1.58
317866	AI690269	Hs.201345	ESTs	1.58
320725	AA703319	Hs.120967	ESTs	1.58
311332	AW292247	Hs.255052	ESTs	1.58
334893			CH22_FGENES.452_7	1.58
318730	AA398215		EST cluster (not in UniGene)	1.58
315889	AW271639	Hs.221744	ESTs	1.58
303702	AW500748	Hs.224961	ESTs; Weakly similar to 73 kDA subunit of cleavage and polyadenylation specificity factor [H.sapiens]	1.57
315086	AI492660	Hs.170935	ESTs	1.57
332514	AA156499	Hs.8454	protein kinase; cAMP-dependent; regulatory; type II; alpha	1.57
335549			CH22_FGENES.576_10	1.57
329532			CH.10_p2 gi|3983505	1.57
323140	AA180467		EST cluster (not in UniGene)	1.57
313166	AI801098	Hs.151500	ESTs	1.57
337896			CH22_EM:AC005500.GENSCAN.56-3	1.57
330658	AA319514	Hs.211093	ESTs	1.57
324585	AI823969	Hs.132678	ESTs	1.57

317151	AW298195	Hs.255735	ESTs	1.57
308818	AI819700	Hs.208231	EST	1.57
326547			CH.19_hs gi|5867307	1.57
318833	H06234	Hs.24888	ESTs	1.57
320488	R31386		EST cluster (not in UniGene)	1.57
306929	AI124514		EST singleton (not in UniGene) with exon hit	1.57
338083			CH22_EM:AC005500.GENSCAN.174-1	1.57
316868	AI660898	Hs.195602	ESTs	1.57
310937	AI472880	Hs.170480	ESTs	1.57
328638			CH.07_hs gi|6004473	1.57
310074	AI651039	Hs.148559	ESTs	1.56
327058			CH.21_hs gi|6531965	1.56
320076	AI653733	Hs.204079	ESTs	1.56
322345	AF086529		EST cluster (not in UniGene)	1.56
314731	AI745498	Hs.204579	ESTs	1.56
318687	H49619	Hs.127301	ESTs	1.56
303841	AI934464		EST cluster (not in UniGene) with exon hit	1.56
302370	AJ009849	Hs.199297	Homo sapiens GNAS1 gene encoding NESP55	1.56
322571	AF156271		EST cluster (not in UniGene)	1.56
318050	AI052093	Hs.133132	ESTs	1.56
303388	AL039604		EST cluster (not in UniGene) with exon hit	1.56
323758	AA833858		EST cluster (not in UniGene)	1.56
328369			CH.07_hs gi|5868388	1.56
329415			CH.Y_hs gi|5868874	1.56
303915	AW468839	Hs.257767	EST	1.56
338794			CH22_EM:AC005500.GENSCAN.528-1	1.56
303074	AA243481	Hs.127320	ESTs; Weakly similar to KIAA0346 [H.sapiens]	1.56
318807	F08434		EST cluster (not in UniGene)	1.56
334287			CH22_FGENES.369_17	1.56
311928	AW024798	Hs.233374	ESTs	1.55
304592	AA505833	Hs.162017	EST	1.55
300785	AA682913	Hs.247179	ESTs; Weakly similar to KIAA0319 [H.sapiens]	1.55
304921	AA603092		EST singleton (not in UniGene) with exon hit	1.55
324605	AW502851	Hs.249978	ESTs	1.55
324473	AW501163		EST cluster (not in UniGene)	1.55
300566	H86709	Hs.21371	son of sevenless (Drosophila) homolog 1	1.55
314165	AA761265	Hs.221281	ESTs	1.55
302868	AA157392		EST cluster (not in UniGene) with exon hit	1.55
314034	AI299137	Hs.154214	ESTs	1.55
325389			CH.12_hs gi|5866921	1.55
331849	AA417078	Hs.193767	ESTs	1.55
320536	AA331732	Hs.137224	ESTs	1.55
303347	AA258033		EST cluster (not in UniGene) with exon hit	1.55
315769	AA744875	Hs.189413	ESTs	1.55
317031	AA973297	Hs.126101	ESTs	1.55
300203	AI827065	Hs.224877	ESTs	1.55
304037	T26438		EST singleton (not in UniGene) with exon hit	1.55
322613	AW160507		EST cluster (not in UniGene)	1.54
317987	AW138174	Hs.130651	ESTs	1.54
322313	AF086386		EST cluster (not in UniGene)	1.54
323992	AW411383	Hs.169688	ESTs	1.54
325303			CH.11_hs gi|5866908	1.54
312701	AI457663	Hs.128127	ESTs	1.54
304787	AA582678		EST singleton (not in UniGene) with exon hit	1.54
305849	AA861571		EST singleton (not in UniGene) with exon hit	1.54
314557	AA401367	Hs.128647	ESTs	1.54
316507	AI381515	Hs.158381	ESTs	1.54
315023	AA533505	Hs.185844	ESTs	1.54
314920	AA513406	Hs.152307	ESTs	1.54
323097	Z44354	Hs.180950	guanine nucleotide binding protein (G protein); q polypeptide	1.54
325043	W27919	Hs.32944	inositol polyphosphate-4-phosphatase; type I; 107kD	1.54
307892	AI376086	Hs.158759	EST	1.54
324573	AA491600	Hs.161942	ESTs	1.54
313092	AI923673	Hs.212827	ESTs	1.54
324696	AA641092	Hs.257339	ESTs	1.54
303019	AF098363		EST cluster (not in UniGene) with exon hit	1.54
317158	AI459140	Hs.129109	ESTs	1.54
309536	AW151933		EST singleton (not in UniGene) with exon hit	1.54
301568	AI146423	Hs.146709	ESTs	1.53

315674	AA651923	Hs.191850	ESTs	1.53
321661	N79341		EST cluster (not in UniGene)	1.53
310890	AI184510	Hs.143728	ESTs	1.53
330036			CH.17_p2 gi|6042048	1.53
316907	AA843868	Hs.190567	ESTs	1.53
312299	AA972712	Hs.174818	ESTs	1.53
331128	R51361	Hs.23423	ESTs	1.53
305177	AA663591		EST singleton (not in UniGene) with exon hit	1.53
337685			CH22_EM:AC000097.GENSCAN.77-1	1.53
335290			CH22_FGENES.527_3	1.53
308896	AI858667		EST singleton (not in UniGene) with exon hit	1.53
307944	AI418246		EST singleton (not in UniGene) with exon hit	1.53
300867	AW340374	Hs.121033	neural precursor cell expressed; developmentally down-regulated 1	1.53
335320			CH22_FGENES.534_7	1.53
329841			CH.14_p2 gi|6672062	1.53
317916	AI565071	Hs.159983	ESTs	1.53
332901			CH22_FGENES.36_2	1.53
305413	AA724659		EST singleton (not in UniGene) with exon hit	1.53
316707	AI016387	Hs.184406	ESTs	1.53
313693	AW469180	Hs.170651	ESTs	1.53
316101	AA922236	Hs.221037	ESTs	1.53
320796	AF038966	Hs.184543	secretory carrier membrane protein 1	1.53
307451	AI248815		EST singleton (not in UniGene) with exon hit	1.53
323648	AI679968	Hs.152060	ESTs	1.53
331482	N27515	Hs.40296	ESTs	1.53
318059	AI023175	Hs.167022	ESTs	1.53
325958			CH.16_hs gi|5867142	1.53
315736	AA664265	Hs.230213	ESTs	1.53
314740	AW015667	Hs.119427	ESTs	1.52
314117	AA224368	Hs.185164	ESTs	1.52
301646	AA313954		EST cluster (not in UniGene) with exon hit	1.52
338752			CH22_EM:AC005500.GENSCAN.513-10	1.52
309314	AW009312		EST singleton (not in UniGene) with exon hit	1.52
301445	AI208364	Hs.128233	ESTs; Weakly similar to REGULATOR OF CHROMOSOME CONDENSATION [H.sapiens]	1.52
308501	AI685263	Hs.201150	EST	1.52
312330	AA635305	Hs.121574	ESTs	1.52
318040	AI018150	Hs.148781	ESTs	1.52
338205			CH22_FGENES.719_10	1.52
325701			CH.14_hs gi|5867028	1.52
315009	AW189460	Hs.208358	ESTs	1.52
303121	AW407585	Hs.27769	ESTs; Weakly similar to mCAC [M.musculus]	1.52
309271	AI986221		EST singleton (not in UniGene) with exon hit	1.52
328385			CH.07_hs gi|5868395	1.52
307700	AI318545		EST singleton (not in UniGene) with exon hit	1.52
314591	AW103292	Hs.245328	ESTs	1.52
304484	AA432067	Hs.258373	ESTs	1.52
304382	AA232873		EST singleton (not in UniGene) with exon hit	1.52
304232	W52674		EST singleton (not in UniGene) with exon hit	1.52
309853	AW298169	Hs.57553	tousled-like kinase 2	1.52
312504	AW207346	Hs.143202	ESTs	1.52
313134	N63406	Hs.258697	ESTs	1.52
330391	AF015950	Hs.115256	telomerase reverse transcriptase	1.52
314342	AI873046	Hs.258775	ESTs	1.51
305977	AA887293		EST singleton (not in UniGene) with exon hit	1.51
301165	N85789	Hs.224155	ESTs; Weakly similar to PTERIN-4-ALPHA-CARBINOLAMINE DEHYDRATASE [H.sapiens]	1.51
300613	AI932294	Hs.249604	ESTs; Weakly similar to B-CELL LYMPHOMA 6 PROTEIN [H.sapiens]	1.51
324124	AI554212	Hs.185664	ESTs; Weakly similar to SERINE/THREONINE-PROTEIN KINASE NRK2 [H.sapiens]	1.51
308037	AI458207	Hs.174181	ESTs	1.51
323909	AL043148	Hs.186257	ESTs	1.51
315464	AW139500	Hs.116135	ESTs	1.51
306700	AI022056		EST singleton (not in UniGene) with exon hit	1.51
337976			CH22_EM:AC005500.GENSCAN.107-1	1.51
306855	AI083982		EST singleton (not in UniGene) with exon hit	1.51
311045	AI569399	Hs.174746	ESTs	1.51
315010	AA531082	Hs.240049	ESTs	1.51
310205	AW025248	Hs.202445	ESTs	1.51
310759	AW135924	Hs.224883	ESTs	1.51

310954	AW449044	Hs.171298	ESTs	1.51
312019	T77046	Hs.188750	ESTs	1.51
334773			CH22_FGENES.430_5	1.51
332043	AA490831	Hs.125056	ESTs	1.51
322850	AA296219		EST cluster (not in UniGene)	1.51
337920			CH22_EM:AC005500.GENSCAN.67-3	1.51
328993			CH.09_hs gi|5868536	1.51
309245	AI972447		EST singleton (not in UniGene) with exon hit	1.51
312172	AI222168	Hs.191168	ESTs	1.51
304039	T47349		EST singleton (not in UniGene) with exon hit	1.5
301329	AI149653	Hs.190496	ESTs	1.5
313376	AI949246	Hs.200381	ESTs	1.5
324248	AW504918		EST cluster (not in UniGene)	1.5
308771	AI809301		EST singleton (not in UniGene) with exon hit	1.5
334935			CH22_FGENES.464_3	1.5
319764	AA019827		EST cluster (not in UniGene)	1.5
318519	T27135		EST cluster (not in UniGene)	1.5
332807			CH22_FGENES.7_9	1.5
322310	AF086376		EST cluster (not in UniGene)	1.5
324557	AA489166	Hs.156933	ESTs	1.5
332118	AA609585	Hs.162689	EST	1.5
319539	R09027		EST cluster (not in UniGene)	1.5
313149	AW291092	Hs.201058	ESTs	1.5
329722			CH.14_p2 gi|6065785	1.5
323514	AA861209		EST cluster (not in UniGene)	1.5
308078	AI472621		EST singleton (not in UniGene) with exon hit	1.5
337965			CH22_EM:AC005500.GENSCAN.100-10	1.5
335905			CH22_FGENES.635_13	1.5

TABLE 14A shows the accession numbers for those primekeys lacking unigeneID's for Table 14. For each probeset we have listed the gene cluster number from which the oligonucleotides were designed. Gene clusters were compiled using sequences derived from Genbank ESTs and mRNAs. These sequences were clustered based on sequence similarity using Clustering and Alignment Tools (DoubleTwist, Oakland California). The Genbank accession numbers for sequences comprising each cluster are listed in the "Accession" column.

Pkey: Unique Eos probeset identifier number
CAT number: Gene cluster number
Accession: Genbank accession numbers

Pkey	CAT number	Accession
322064	234514_1	BE261397 Z78343 BE176419 AA383657 N90840 AA334052 AW955761 BE536232 AA374087 AA584776
321409	197898_1	N71838 AA282003 T54072 AA781419 H92966 AI831371 AI095435 AI690247 R99331 AW964110 AA975590 AA346128 H94196 C03864
322092	46678_1	AF085833 R69689 AW341677 AA923375 BE327566 AW630415 R69601 AW615339
321452	212379_2	AW962489 H64300 AA329527
313603	199797_1	AA284333 AW468119 AA284334 AA810992
320856	36098_1	AB040928 T94673 AI289313 AI536039 Z44366 BE141499 D60116 D61488 D59945 AA419503 R28090 R72986 H03255 AI189112 AI912312 AW511018 AI401349 AW470144 C14624 AI335797 Z40300 AI014456 D60269 D60115 T16722 AI370673 D60270
322139	46806_1	H53744 AF075088 H53797
321500	552826_1	BE004271 AI248023 AI022157 H71999
313733	441212_1	AA766346 AA809877 AA836116 AW469598 AW977404
322215	47002_1	AF088005 N51816 N51731
322235	47070_1	AF086106 AI193589 AW665594 N71795 AA722627 AW665373 AI300251
321632	286374_1	AW812795 AA419617 H87827 AW299775 AW382168 AW382133 BE171659 AW392392 BE171641 AA541393
313833	120893_1	AA766825 AA811180 AA085906 AI762946 AW977820
322310	47376_1	AF086376 W77804 W72689 AA837735
322313	47386_1	AF086386 W77947 W72708
322322	47434_1	AF086431 AA886756 AI557237
322331	47467_1	AF086467 W81444 W81445
322345	47537_1	W95298 AF086529 AI912190 AW294159 AI458747 W94782
322347	47545_1	AF086538 W95989 AI631911 W95835
322370	187612_1	AA330095 W25112 AA249401
321739	43998_1	AL080280 T73124 H02689 AL080281
321781	1511778_1	D78667 D78871 C18258
314570	280469_1	AA904776 AA405698 AA405962
300129	635249_1	AW028820 AI219068
322452	497108_2	AI147202 W56755 W56710
321861	1651920_1	N79341 N99082 N47551
323140	159551_1	AA180467 AA449184 AA464831 AA505048
322520	38916_1	T55958 T57205 AF147346
321914	85114_1	AA011603 N58604 N58611
322571	22297_1	NM_016102 AF156271 AA781888 AW152318 AW770403 AA909463 AA482996 AA758672
322574	39412_1	AF156548 AA639797 AI675267 AI825497 AI823355
314753	311451_1	AA463262 AA463615 AW160405 AW407583
300370	3910_2	AW136181 AA581939 AK001221 AA694538 AA424043 AI016272 AA098960 AA884473 AI356180 BE391633 AA437086 AI277866 AA098827 AA992680 BE172624 AA424101 AA320776 AW962967 N77431 AW858960 AW858897 T85649 AA357743 AI827817 AI905672
322601	577912_1	AI082395 W92924 BE048524 AW005302 AI084474 AI369330 AI827710 AW135506 AW298694
322613	34330_1	AW160507 NM_013367 AF191338 AA384939 AI445790 AA730309 BE397003 BE267753 AI979163 N50386 AW583671 AW583608 BE074466 BE074479 BE074471 AW976283 AA604393 AW162122 W73648 AI823475 N75898 W73713 AW470099 AW513236 AW025055 AW613115 AI923379 W58081 AW664525 AW196795 AI143619 AI565152 AA025406 AA505846 AI685494 AA829964 N59156 N59163 R15442 AA826919 AI610221 AI200120 AA603279 AW150822 AI189513 AI807122 AI016368 AI335868 AW583389 AI193892 AI956157 AI628879 AW591589 AW583446 AI955406 AW148396 AI340255 AI667942 AA748525 AA876991 Z38516 AI874002 AI869474 N63100 AA429094 AA082443
316055	409389_1	AW105663 AA693880 AW517398 AI768507 BE220851 AW978538 AA831489
323316	981458_1	BE219300 BE327455 AL134620 R36741 R17998
300492	25768_1	AL031709 AI249061 AA907658 AI420444

316141	423880_2	AW303457 AA972713 AA724265
323371	117336_2	N45114 N51465 BE087338 AI083551 AL135118 BE395609
307700	30923_11	BE280998 BE254670 BE294951 BE564979 AW405364 AA069258 AA129837 AI559667 BE281405 AW410850 BE041153 AI254811 AW301340 AI613335 AW301411 AI609469 AI611607 AI611616 AI377623 AI335509 AI613544 BE043165 AI371663 AI340452 AI612066 AW072890 AI254558 AI349884 AI370095 AI613383 AI611946 AI613353 AI307414 AI318229 AI612685 AW305327 AW268924 AI370063 AI349292 BE049068 AI369098 AW274098 AI344845 AW075187 AI053401 AI345220 BE138515 AI613386 AI583302 AW301955 AI349661 AI307432 AI054168 AI223913 AI612081 AI348942 AI334539 AI309366 AI370098 AI252360 AW086316 AW268911 AW073482 AI379802 AI224284 AI053661 AI334538 AI309369 AI309688 AI310023 AI492709 AI335418 AI053999 AI366989 AW073478 AI247058 AI249584 AI305875 AI308585 AW071272 AI271487 AI340719 AI366995 AI223673 AW271066 AI611936 AW071296 AI270796 AI254385 AI251393 AI252562 AW268236 AI254858 AW071317 AI309102 AI609897 AW268971 AI583267 AI792484 AW075168 BE138443 AI254126 AI309822 AI310872 AI611953 AI251054 AW276658 AI335405 AW075039 AI311768 AI612028 AW271895 AI612005 AI312240 AW271082 AI371642 AI334879 AI310194 AI310772 AI345419 AI334675 AI223914 AI284707 AI284813 AI349140 AI254853 AI313094 AI310170 AI309499 AI312476 AI376484 AI335467 AI340802 AI309815 AI310168 AI611446 AI345824 BE327775 AI318545 F17185 AW614950
308362	792518_1	AW998989 AI613519
307783	697809_1	AI347274 AW844024
301161	427238_1	AA731518 AA765714
324094	270098_1	BE395109 AW663898 AW237041 AI492154 BE046906 AI651285 AI983290 AW002590 AI201040 F32424 AA992272 AW271836
309023	4737_1	AF180681 NM_015313 AA229509 AA225792 AA216413 AI888045 BE005205 AB002380 T55518 BE276097 AW380669 BE142836 AW370976 AA479384 R96425 AI680999 AA595138 H54582 AI022709 T55440 AI041769 AA861144 AW392028 AA479287 AA824634 AI638446 H54691 R96382 AA770352 AI640467 AW293491 AA779138 R28298 AA970562 C15590 R84455 AA020769 AL036394 H80566 BE548881 AA301207 AW959414 AI284253 AA043173 W52429 BE544571 R24852 Z42603 F13120 R24340 R24326 T75305 H70110 N56255 AA334210 F11453 AW947285 H80345 AA298992 AW380931 AI267175 Z45421 AW380981 W86113 AA663590 AA167577 BE566760 BE169166 AA449904 AA459205 N31126 W03564 N31208 AW993277 N44765 AW605275 D61449 W68572 AA258190 D60496 AW992964 U46277 H04097 AA370360 AW957211 AA159775 AI631243 H83367 H21671 D61077 AW392712 N21112 H98522 N45298 N83629 AI393509 AW022043 AA744886 AI580482 AA723286 AI422244 AI423984 D62804 AI088349 AA587890 AI144172 N33275 BE074397 H03399 D62578 AI056639 AI828918 AA579584 AI089460 AI350124 W68573 AI580828 H98897 AI570468 H83715 W86114 AA923123 D57446 AA043174 AW337721 AI266551 AI140017 AW022356 D79855 D79650 D79393 D60495 AA788666 AA693443 AW516977 W60139 AI628156 AW473223 AI608892 AA159670 AW440366 AI421529 T50751 AI174374 AA912234 AA724248 AW780400 AA907218 H80514 D57452 AA863419 AA552618 D29614 R44556 T16452 R44935 Z41132 D29188 H69692 AI250176 AI078860 AA370359 AW183108 H74200 AA258183 F10723 C00323 R86148 AA860570 AW130073 AL079946 AA410327 AA532614 AA234500 AI151507 AA410288 AW969839 AA483232 AI383200 AA236540 AI807672 H73441
323473	193878_1	AA262442 AA768862 AA262443
315639	392767_1	AA827650 AA827652 AW629526 BE044585 AW974451 AA761439 AA648505 AA765803
322878	117013_1	AA081820 AA082191 AA079811
301239	457668_1	AA807558 AA827117 AW629567
301256	16720_1	NM_016603 AF251038 AI124624 AA776579 AW298470 AI304868 AW082724 AI348442 BE218336 N20641 AI018013 AW858832 AW978157 AA815187 AA932948 AF157316 AI444958 W00848 W02935 AI434933 N26335 AA428681 AW371059 AI651612 AW134937 AW968911 AA488815 AL157523 W48766 AW936954 AW936941 AW579205 AW936886 AW936889 N74541 AW936953 AW578421 AW604352 AW367088 AW849258 AW849453 AW371606 AI554921 W49785 H99814 AA805957 AA904606 AW206696 BE169229 AA333951 AA190704 AW936944 AA463219 AA430306 AW805704 N48503 BE222307 AI638612 BE550045 AI805304 AI690987 AA776841 H12690 AW183731 AI380760 AI636261 AA812641 AW592656 AI686132 AA843424 H99220 AW084996 AW128879 AI800871 AA610135 AA191524 AI150076 AI474530 AA748461 N29013 AA746372 N59606
300611	337193_1	N75450 AA877636 AW137945 W05248 AA514763 AW972399 AI758397 AW195051
324157	247225_2	AW402931 BE393099
323509	987739_1	AL036947 T93676 T85475
323514	197787_1	AA641735 AA281881 AA861209 AA934756 AA835887 AA641795 AA748822 AW295703
300674	466093_1	AW467388 AA826954
322932	39838_1	AF168711 AA099732 BE019157 AI380212 BE298159 AA249097 AA305112 AW962349 AW962353 AW401801 BE292961 AI439469 AA442919 AI630537 AA724473 AI814288 AW966815 AI376871 AI860202 AI683132 AA099733 AW627633 AI754022 BE206347 AW183349 AI378222 BE178926 AI473282 W52944 AW752469 AW966817
323591	209807_1	AA301270 AA301379 AA301366
322950	10774_1	R85652 AA114024 AA298219 AA375304 AW963796 AW885952 AW020969 AA114025 AI804930 BE350971 AI765355 AW317067 AW974763 H85930 AW172600 AI310231 AW612019 D62908 D62864 AA652738 AI674617 AI494064 AW138666 AI147620 AI147629 AW611793 AI668922 AI971005 AI864742 AA174171
322957	29014_1	AK001701 AA134337 AA356202 BE163251 AW875175 AW875181 AW875177 BE163389 AK000741 AA247755 AA120819 AW868040 AA309118 AW962348 AA471267 AW996843 AK001452 BE005344 BE617899 AA186588 AA120820 AW363311 AA648105 N71529 BE168417 AW673900 AI858160 AA134338 AA659697 N22162 AI335437 AI311237 AI343171 AI336661 AW268074 AW274348 AA935005 AW576295 AW262626 AW593153 AA730055 AA662650 AA782687 AW894855 AI933533 AW193002 AW899448 AW880142 AW812670 AA085664 AA334191 BE178085 BE180553 AA389680 AA984772 AA442527 W26560 BE384359 AA847210 AW304931 AI669606 AA085613 AW197240 AI632828 AA581646 AW129348 AI017643 AW089030 D20893 AI382955 AI557148 AW499979
324231	975669_1	W60827 AL079968 AL047234
324248	977901_1	AW504918 N55410 AL118584 AW839266
323691	221757_1	AA317561 AI793000 AW235111 AI793178 AA767397 AI263113 AA719462

315858	406384_1	AA737345 AA682288 AI799378
301431	569736_1	R05385 AI061251
324303	233842_1	AL118754 AA333202 H38001
324330	300543_1	AA884768 AW974271 AA592975 AA447312
300815	41537_2	BE152396 BE152395 AA287515 BE001834 AA286678 AW406477
324349	1154015_1	AW501470 AW502931 AW499500
323715	225129_1	AA322155 AA326396 AA326538
309314	23273_-3	AW009312
323758	229624_1	AA833858 AW978090 AA327679 AA810436
309375	127_1	AF286598 AW075342 AB028994 AL043713 AW378914 AA340650 N57166 AW956914 R17961 AA336481 BE393734 AW977867 AW294638 AA927857 AA961627 AW303969 AW894416 AA812119 AA912758 AA424355 AA490582 W30941 AA476693 AA131029 AA127777 AL043714 AA496984 T51117 AA127722 AA594012 AI492876 N76483 AW119061 BE464926 AW303419 AI972370 AI768172 AI826550 AI435432 AI379516 AA778421 AI276089 AA424521 N59361 AA723153 AA723176 AI867487 AA090677 AI827221 AI351027 W02732 AI810729 AA142848 AI082110 N59379 N29744 AI283747 AI148665 AW779845 AI382967 F34319 AI369934 AI282438 AW183449 AA863467 AA813469 AI092645 AI870701 AA863119
325031	266373_2	T65475 R07576 T17017 F08143 Z43546
325045	1534945_1	T08845 Z43538 F06691
324473	38795_1	BE560824 BE513941 AW238907 AA580852 AW501176 BE241846 AW501163 AW751433 AW501340 BE241715 AI910774
323827	235506_1	AW406878 AW966560 AW966151 AW966496 AA336174 AA335376 AA335537
302270	1734192_1	R56151 W91936
301618	10967_5	T52761 T52760
301646	42154_1	AJ277841 AI630669 AI804370 Z41939 AW751251 AA299456 Z44739 AW860471 Z30158 AW105391 H56997 W84688 AA491201 W84636 AA706815 AI131055 AA483636 AI005075 AW340034 AI332372 AW118195 AI338932 AI191968 AA693932 AI189982 AI193225 AA884163 AA594562 W37747 AA249754 AA746131 AI916540 AI832188 AW946555 AA833838 Z40564 AA861563 F01447 AA887937 AI933559 AW973250 AA566018 AA313954
323923	249295_1	AA354146 AI184230 AA643525
324580	328264_1	AA492588 AA492498 AA492571
316774	463723_1	AA814859 AA814857 AI582623
309577	6483_6	AW902251 AW168753
302345	29533_1	X12830 NM_000565 AW503691 X58298 S72848 AA193347 AW503481 AW177946 AW178192 AW178188 AA285233 AA410577 AA193465 AW177939 AW365459 BE221693
302358	1064753_1	AW207734 D60164 D81150 D81078 D61356 AW996804
324614	215437_1	AW503101 AA309184 N56323 R70998
324661	385257_1	AW504161 AW503601 AW505509
324685	41003_1	AF226667 AA207032 AA100804 AA121287 AA488316 AI808218 AW419048 AI911097 AW132123 AA502311 AW089948 AA100952 AI075431 AW083432 AI990554 BE466029 F28643 AF086422 W79581 AW439007 F37179 W79780 AW439035 AA731381 AW750380 AA251012 AW589846 AA730238 AA329792 AW087255 AA220982 AA082469 AA877260 AA232380 BE298910
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316893	473541_1	AW979189 AA837332 AA856946 AA876935
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324715	290035_2	AI739168 AA426249 AI199636 AW505198 AW977291 AA824583 AA883419 AA724079 AI015524 AI377728 AW293682 AI928140 AA731438 AI092404 AI085630 AA731340
324771	385085_1	AA631739 AA768584 AW134477
324783	389615_1	AA640770 AI683112 AA913009
303114	37417_1	AF090948 AI064898 AI111182
303124	21112_1	AB018257 BE148640 AA081832 AK001915 AF150217 AF161350 AI219174 AW074664 D60040 AA346065 H28750 AW151783 BE613360 BE612628 BE502031 AW183790 AA992580 AA505815 AI310432 AI678015 AW592679 AA879181 AA806708 AI744110 H24681 C16064 D62900 AI285033 AA346064 AI865123 AW467798 BE221231 AL120676 N89877 AI928370 AI358387 AA748486 AV647478 AV647460 AA312313 AI279340 AW505099
302552	82290_1	AA005122 H49792
301918	316229_1	AA476777 T86049
303232	20474_1	AA437414 AA131479 AA086182 AB037775 AW161063 AW514393 AA332331 AW136197 BE150789 AA425533 AA249605 N88308 AI016201 BE004662 AA291027 R57587 AA424277 AA476391 W07532 T97036 AA218898 AW162629 R57770 W01278 W90204 W90156 AL119197 R84513 AA280103 AA334994 AW965504 AA460868 AA447470 AW138594 W38898 W90028 AI078353 W90078 AA699696 N35523 AA704225 AA035059 AW134892 AA115140 AI142854 H90084 AA826342 AA460694 N46339 AA425344 N56953 AA035569 AI761083 AI658696 AI524818 AI338965 AW069249 AW299871 BE464061 AI189720 AW340682 AI423380 AI275122 H17532 N80735 AA826343 AI039694 BE328398 AI192947 AW271286 AI623122 AI922902 AW293087 N22141 AA730657 AW316610 N26473 F06663 Z43810 H14783 R59761 H11540 AI265915 AI681773 AI091748 BE220636 AW841861 AI702181 AI468447 AA907544 AI273941 AW244034 R37769 AA446663 T96929 BE045884 AA476341 H89994 H29043 AW051211 N49522 AA306977
302696	33570_1	AK000738 AA347452 AW961713 H70832 AI750643 AA362887 AW955588 W44974 AA279599 AW298762 AA452666 AA443355 AI337273 AA446931 AI752977 AA661554 W42674 AI292172 R41163 AA621381 AI244157
302697	43219_1	AJ001409 AJ001410
309917	57485_2	AW340014 AW866993 AV651649
303347	192210_1	AA258033 AA459485
303349	193138_1	AA382661 AW958642 AA259088
310599	690880_1	AW300144 AI338491 AI798381 BE220076

303388	969232_1	AL039604 AL039497
302761	45074_1	AW250553 L07876 Z36843 R30693 AI190097 AW965317
318455	606341_1	AI148763 AI903763 AI903753 AI903762 AI903800 AI903801
317850	363835_1	AI681545 AI951714 AI570397 AW873588 AA836396 AI359986 AI499790 AA773477 AI951615 T07547 AW304709 AF114041 BE176629 Z44580 T30422 T32690 AW953065 H10602
303431	32082_1	NM_000539 AA019013 AA019367 AA056154 H38735 AA057003 AA021051 H38102 AA015774 AA059291 AA019439 H84843 H83375 AA019914 AA017288 R84449 W26519 H38258 AA018736 H84147 AA018577 AA059353 U49742 H38767 AA318341 AA317553 H86646 H91989 AA317398 AA317378 W29024 W23034 T27877 AW950059 AA017185 R84262 AA057177 H89941 AA019904 H84662 AA015775 AA019368 AA020976 H37900 C20733 H38682 H85197 AA018578 AA017252 AA019440 AA059059 H38651 H84148 AA018560 W25754 C20752 AA317915 AW952115 AA317369 AA019845 R85402 AA019492 AA017196 AA056093 AA056094 AA058836 AA056155 W25957 W23027 AA056159 W23043 W21890 W28951 AA317978 W26459 AA317265
319127	1653640_1	N49476 Z45911 R21061
303480	232749_1	AA331906 AA332484
303481	31534_1	AK001952 AA336839 AW249271 BE247287 AF182002 BE613472 AW962673 AA332235 AW849937 AW849814 H49893 AA477148 AW968944 AF182003 AW007897 BE246145 W76100 AI480141 AW410205 AA609339 AI209111 AW000979 AA330280 AW961554 W72865 H49894 AA514317 AA620407 AA504522 AW472833 AA716609 AW129282 AA347351 AA628378 AW589860 AI636696 AA464632 AA464533 AW874189 AA757076 AA479654 AW517910 AW292357 AW872638 AW262288 AI910666 AW513749 AW238771 AA215797 BE387073
303487	20890_1	BE143533 AW850432 AK000042 AA333666 AA385314 AW966616 AW793068 AW793414 AA361103 AW390841 AA040095 AW385058 AW799162 AI383115 AI990745 AI653703 BE503693 AW150758 AI949919 AW190450 AW512348 AI625970 AW501057 N52954 AI281378 AI401710 AI648409 AW002659 AI687639 AI093943 R33960 AA040062 AI926267 AI240425 AI520911 AI093428 R52943
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303494	236389_1	F30712 F35665 AW263888 AI904014 AI904018 AA336927 AA336502
319142	164820_1	H08370 Z46168 F07366 AA193168 AA193138
302868	12593_1	AK000290 AI476034 AA465309 BE148761 AW303607 AW958665 AW469635 AI819365 AI243857 AW469326 AA157110 AA278626 AA496257 AA306656 F29732 AA831859 AA312210 AA564476 AA579065 AA769522 AA740386 AI205635 AA491643 AA810400 AA417708 AI567332 AA157392 N53817 AA374229
318518	1205335_1	R68545 T27119 R25687 AW750672
318519	434741_1	H13364 T27135 R61679 AA746905
304168	72494_-10	H77679
302948	21445_1	AB038995 NM_016530 AK001111 AA465635 AW968716 U66624 AA885459 AA703019 AI040266 AI018689 AI692886 AI125372 AI376796 AI192040 N58161 AL133607 AW503673 AW505479 AA362265 AJ404671
319250	244351_1	F11623 H17552 AA347728
318644	17700_1	BE311816 AK000916 AW868037 AW868039 AF228527 AI752482 AW868041 AA077049 AI201537 W55873 AA206019 AA077918 AW968729 AI978828 AW139620 AI093053 AW204025 AI418805 AA598926 AA586345 AA045669 BE314455 AA045668
318674	204968_1	W01166 AW996900 BE184300 Z44887 T34535 R51495 AW886575 AA295490 AA295162 AA295163 AW937125 T56951
304232	20640_2	BE386106 W52674
303685	8088_1	AW500106 BE241915 AW503971 NM_016542 AB040057 AA313812 AK000556 W16504 AI822088 AA259107 AA191319 BE085957 AA308584 BE122687 AW952435 T84469 BE088194 BE088132 AA328562 BE092674 AA263102 T39634 AW992380 R79391 R24392 H03060 AW675066 AI299952 AW020325 D25953 N75199 AA361425 AW612302 AW236333 AW673897 AW953686 N22323 AA649166 AI377099 H03061 AI660072 AW276405 AA809779 AI803430 AW297484 AW510384 AA814816 AA371522 D63035 AA953567 R79392 R24282 AA876831 AW297542 AI699023 AA992652 AI041436
318704	799152_1	AI631602 AW589676 Z28684 Z24981
318730	275116_1	Z32887 BE349923 AA398215 AA399231
303714	1155758_1	AW501336 AW501337
304387	183612_1	AA236027 BE003275
304398	10169_1	AA195509 BE394661 AV660757 AA489161 BE165972 AW503705 AA262785 AF123320 Z78357 NM_014171 AF161488 AA248971 BE568575 AA461410 AA165108 AI637731 H75454 AA372934 AW339334 BE568754 BE564697 BE567299 AI681606 BE537269 AW197204 AA290890 AI189393 AW292463 AW470227 F27399 AW611942 BE566888 AW301701 AI675761 AI628429 AA164711 AI797753 AI656879 AI912690 AI675277 AI695099 AI094095 AW014158 BE091059 AI201748 AW236961 AI038003 AI083606 AA401608 AI079405 AI073516 AI655537 AA401475 AI814532 AI079862 AI093789 AI422084 AI216476 AI392760 AA926998 AA781782 Z25198 AI086377 AI185511 AI185539 Z28843 AI223792 AI379563 AA706253 AI433798 AI921885 H75455 AW025269 AI224100 AI083611 AI225057 AW196334 AI572254 AA761628 AI472801 AA283784
303751	468554_1	AA830149 AW978407 M85983 AW503637
319401	1323199_1	W00973 N56457 AW992226 T84921 R01342
319402	1003489_1	R86913 R86901 H25352 R01370 H43764 AW044451 W21298
318807	1536467_1	F08434 Z42573 H28810
319478	765461_1	AI524124 R06841 R06842
318872	1534581_1	Z43108 F06295 R13085

318885	94880_2	AA742999 Z43272 AA345258 AW956677 AA031942
303841	79133_1	W19657 BE616760 BE259848 BE382680 BE615587 AI934464 AA322745 T07155 AW961174 AA307302 Z41888 AA621992 AA188400 AW770608 AI147458 AI148408 AI696291 AA972591
303889	1777183_1	T19204 T36109 T36107
319539	63198_1	R09027 AA344892 AA329574 AW955648 AW978708 AI567804 AI378935 AW014657 AI804134 R08922 N92947 BE546788
318905	1536408_1	F08365 Z43395 R54298
320187	396254_1	T99949 AA654769 AA664550 AW975264
318996	65715_1	Z44268 H06384 AV655948
319635	163534_1	R17531 AW960899 AA338366 AW673294 BE047729 BE047722 AA330746 AW841797 H05030 AI142105 R12654
319699	747196_1	AI458682 H24240 R14537 R18426 AW867082
319713	1699356_1	R24204 R15712 T84695
319761	75324_2	AW630974 BE005208 R84237 AA724997 AA334867 AW955777 R18816
319764	88596_1	AA019827 R18947 H46852
319808	7069_3	T58960 AA609180 AA621130 AI927236 AA431075
321040	193331_1	AA261830 AW967855 H26953 AA262478
320409	43709_1	AA226869 AA296516 AW959753 AA186390 AL359619 AA356195 AA148427 R22748 AI033624 BE548853 H95327 AW579751 BE561649 AA397533 BE617136 AA236444 T89946 AA247450 N55777 W38725 AI743848 AI808406 AA922229 AI051464 W04713 R11251 W19656 AI042319 AA489276 AI224533 H95274 AW269958 T89311 AI890088 AI862754 AI830968 AI669336 AI589780 AA534557 AW273839 AI338155 AI126632 N83542 BE046048 AA807028 AA848107 AW167978 AA976930 AA148428 AI289304 AI524262 AI625961 AA773469 AI222288 AI280054 AI242371 AA227222 AA973329 AA296517 AA829436 AA234526 AI149769 AI567865 AA936939 AI590681 AW469308 AI689531 AA486419 AI422051 AI057252 AA626941 AI475352 AW247913 AI222370 AA670122 AW198034 AA486418 AI363794 AA380739
319881	1585983_1	H51299 H44619 H46391 R86024 H51892 T72744
320488	368456_1	AI817336 R32883 AA595590 AI743065 R31386
321121	1545647_1	W23285 H42714 F25381 F37215
321205	81249_1	AA002047 N72537 H54142 H81580
321253	375160_1	AA610649 AI699484 H59558
314043	155125_1	AA827082 AA732246 AA167611 AA830741
320630	17685_2	AA199847 AA410224 R53323 AW936567 AW936569 AW936568 AW936571
313435	443527_1	AA769123 AA831715 AW977666 W92553
313443	82292_1	AA005125 W95019 W93335 AA249037
313472	82811_1	AA007374 AA007466 AI816886
321348	41762_1	Z49979 D61703 U30168
314138	179960_1	AA740616 AA654854 AA229923
320712	57156_2	R66867 R65678 R82673 W73128 R83101
321383	41924_1	AW968556 AJ238555 AW968731 AJ002574 AA459446 H70260 AW977557 AA767351 AW268572 AA810719 AI698677 AI300460 AA907450 AA649224 T07415 AI536896 BE018515 AI279865 BE047421
312996	187327_1	AW368634 AI702169 AI245179 AW368646 BE545574 AA249018 AW368633 N27553
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306537		AA991705
306557		AA994530
306598		AI000320
306620		AI000929
306700		AI022056
308078		AI472621
306813		AI066544
306830		AI075803
306855		AI083982
329722	c14_p2	
329728	c14_p2	
306890		AI092235
308100		AI475949
308147		AI498991
306929		AI124514
308352		AI610791
308383		AI624497
308521		AI689808
308561		AI701559
308617		AI738720
308771		AI809301
308828		AI824829
308896		AI858667
303019	41850_1	AF098363 AF098365
303084	44211_1	AF174008 AF174027 AF174106
305092	AA642912	
305169		AA663131
305177		AA663591
305235		AA670480
305413		AA724659

305849		AA861571
305854		AA862733
307113		AI183686
307130		AI185234
305937		AA883238
305977		AA887293
307451		AI248615
307513		AI274307
307848		AI364186
307871		AI368665
307881		AI370434
307932		AJ230822
307944		AI418246
307954		AI419692
307965		AI421641
309245		AI972447
309271		AI986221
309365		AW072861
309372		AW074330
309435		AW090537
309506		AW137700
309536		AW151933
309709		AW242630
325417	c12_hs	
325450	c12_hs	
325452	c12_hs	
309815		AW292760
309839		AW296076
309849		AW297444
309906		AW339340
302705	31765_1	U09060 U09061
304037		T26438
304039		T47349
304236		W93278
304257		AA053294
304382		AA232873
304405		AA282572
304561		AA489792
304569		AA490934
304787		AA582678
304921		AA603092
327819	c_5_hs	
304968		AA614308
306382		AA968967
331263	47479_1	AW780192 AA015718 W02571
332252	1663987_1	N63882 T91174

TABLE 14B shows the genomic positioning for those primekeys lacking unigene ID's and accession numbers in Table 14. For each predicted exon, we have listed the genomic sequence source used for prediction. Nucleotide locations of each predicted exon are also listed.

Pkey:	Unique number corresponding to an Eos probeset
Ref:	Sequence source. The 7 digit numbers in this column are Genbank Identifier (GI) numbers
Strand:	Indicates DNA strand from which exons were predicted.
Nt_position:	Indicates nucleotide positions of predicted exons.

Pkey	Ref	Strand	Nt_position
332807	Dunham, I. et.al.	Plus	297686-297808
332808	Dunham, I. et.al.	Plus	298277-298360
332812	Dunham, I. et.al.	Plus	309688-310561
332901	Dunham, I. et.al.	Plus	1841954-1842090
333149	Dunham, I. et.al.	Plus	3574317-3574413
333916	Dunham, I. et.al.	Plus	8298994-8299169
334026	Dunham, I. et.al.	Plus	9196549-9196681
334061	Dunham, I. et.al.	Plus	9686941-9687077
334073	Dunham, I. et.al.	Plus	9792201-9792374
334150	Dunham, I. et.al.	Plus	10529221-10529854
334379	Dunham, I. et.al.	Plus	13908356-13908467
334719	Dunham, I. et.al.	Plus	15778859-15779026
334773	Dunham, I. et.al.	Plus	16235169-16235328
334893	Dunham, I. et.al.	Plus	19302753-19302881
334935	Dunham, I. et.al.	Plus	20108247-20108373
335146	Dunham, I. et.al.	Plus	21491292-21491457
335320	Dunham, I. et.al.	Plus	22542132-22542246
335568	Dunham, I. et.al.	Plus	24935021-24935655
335586	Dunham, I. et.al.	Plus	24990333-24990497
335601	Dunham, I. et.al.	Plus	25044923-25045157
336036	Dunham, I. et.al.	Plus	29019796-29019877
336123	Dunham, I. et.al.	Plus	30051089-30051186
336268	Dunham, I. et.al.	Plus	31997555-31998040
337173	Dunham, I. et.al.	Plus	23624127-23624224
337460	Dunham, I. et.al.	Plus	32536159-32536395
337685	Dunham, I. et.al.	Plus	3547161-3547245
337736	Dunham, I. et.al.	Plus	3850500-3850643
337780	Dunham, I. et.al.	Plus	4113793-4113990
337965	Dunham, I. et.al.	Plus	7034267-7034392
337976	Dunham, I. et.al.	Plus	7166011-7166119
338030	Dunham, I. et.al.	Plus	8072708-8072827
338112	Dunham, I. et.al.	Plus	10391398-10391600
338165	Dunham, I. et.al.	Plus	12205719-12205875
338178	Dunham, I. et.al.	Plus	12800037-12800181
338427	Dunham, I. et.al.	Plus	19685043-19685354
338506	Dunham, I. et.al.	Plus	21221871-21221953
338794	Dunham, I. et.al.	Plus	27114697-27114763
338910	Dunham, I. et.al.	Plus	28795375-28795551
339047	Dunham, I. et.al.	Plus	30760793-30760968
332864	Dunham, I. et.al.	Minus	1390386-1390296
332933	Dunham, I. et.al.	Minus	2035790-2035681
333193	Dunham, I. et.al.	Minus	3832993-3832494
333712	Dunham, I. et.al.	Minus	7286177-7286073
333940	Dunham, I. et.al.	Minus	8523830-8523671
333942	Dunham, I. et.al.	Minus	8552629-8552330
334287	Dunham, I. et.al.	Minus	13294116-13293871
334387	Dunham, I. et.al.	Minus	13946021-13945781
334487	Dunham, I. et.al.	Minus	14432191-14432132
334913	Dunham, I. et.al.	Minus	19463909-19463815
335109	Dunham, I. et.al.	Minus	21325792-21325667
335250	Dunham, I. et.al.	Minus	21952922-21952826

335288	Dunham, I. et.al.	Minus	22304275-22303770
335290	Dunham, I. et.al.	Minus	22309950-22309891
335549	Dunham, I. et.al.	Minus	24666203-24666128
335862	Dunham, I. et.al.	Minus	26690300-26690125
335864	Dunham, I. et.al.	Minus	26694537-26694382
335905	Dunham, I. et.al.	Minus	26988888-26988719
336205	Dunham, I. et.al.	Minus	30477456-30477311
336276	Dunham, I. et.al.	Minus	32093320-32093181
336433	Dunham, I. et.al.	Minus	34067540-34067425
336605	Dunham, I. et.al.	Minus	15616509-15616358
336616	Dunham, I. et.al.	Minus	26021027-26020848
336679	Dunham, I. et.al.	Minus	2035790-2035681
337043	Dunham, I. et.al.	Minus	17407330-17407251
337272	Dunham, I. et.al.	Minus	28241476-28241307
337357	Dunham, I. et.al.	Minus	30906179-30906109
337393	Dunham, I. et.al.	Minus	31471747-31471569
337497	Dunham, I. et.al.	Minus	33371317-33371258
337646	Dunham, I. et.al.	Minus	2648689-2648632
337920	Dunham, I. et.al.	Minus	6051648-6051510
338083	Dunham, I. et.al.	Minus	9318438-9318301
338220	Dunham, I. et.al.	Minus	14166440-14166104
338752	Dunham, I. et.al.	Minus	26421374-26421135
338763	Dunham, I. et.al.	Minus	26628148-26628009
338983	Dunham, I. et.al.	Minus	29908865-29908702
339209	Dunham, I. et.al.	Minus	32492953-32492593
325240	5866848	Minus	32301-32650
329532	3983505	Plus	42937-43014
329522	3983507	Minus	35265-35458
329519	3983510	Plus	18407-18597
329511	3983514	Plus	20965-21325
325326	5866875	Plus	47726-48024
325303	5866908	Minus	73556-73630
325389	5866921	Plus	239672-239759
325417	5866925	Minus	110635-110745
325450	5866941	Minus	435379-435552
325452	5866941	Minus	704103-704202
325498	5866967	Plus	173372-173930
325587	6682462	Plus	126724-126967
325602	5866994	Plus	79122-79251
325701	5867028	Minus	72936-73046
325780	6381953	Plus	63634-63873
329722	6065785	Minus	112713-112992
329728	6065785	Minus	207544-207741
329666	6272129	Plus	98307-98446
329815	6624888	Minus	68431-68720
329841	6672062	Minus	40181-40331
325824	5867048	Minus	42450-42833
325866	5867076	Minus	94358-94628
325902	5867101	Minus	127729-127842
325958	5867142	Plus	53437-53550
326014	5867160	Minus	10358-10447
329941	6165199	Minus	34319-34411
330002	6623963	Plus	46097-46158
326154	5867170	Minus	7103-7179
326023	5867245	Plus	171799-171896
326278	5867269	Plus	75250-75903
330036	6042048	Plus	117120-117216
326547	5867307	Minus	623677-623870
326495	5867423	Plus	11843-11930
326507	5867435	Minus	13038-13111
326505	5867435	Minus	8818-8949
326506	5867435	Minus	9368-9509
326530	5867441	Minus	303000-303122
326508	6682496	Plus	78904-79112
330120	6671864	Minus	127553-127656
330123	6671869	Minus	35311-35406
326858	6552462	Minus	69337-69670
326983	5867657	Minus	16023-16581
327014	5867664	Plus	1017630-1017788

326930	6456782	Plus	606950-607705
326920	6456782	Minus	42425-42519
327058	6531965	Plus	2384268-2384835
327061	6531965	Minus	3486389-3486673
327075	6531965	Plus	4041318-4041431
327120	6531970	Minus	6-1088
330126	6093735	Plus	82458-82623
327157	5866841	Minus	4408-4746
327183	5867442	Plus	84317-84531
327192	5867445	Minus	194652-194764
327288	5867481	Plus	48583-48773
327469	5867772	Plus	145549-145708
327489	6004459	Minus	57796-58015
327526	6381882	Minus	97010-97123
327574	5867818	Plus	68767-69126
327665	5867839	Plus	141736-141900
327752	5867949	Plus	93721-94421
327819	5867968	Minus	92202-92717
327796	5867982	Plus	85267-85405
330260	6671884	Plus	45203-45269
330282	6671910	Plus	3982-4114
328078	5868008	Plus	72807-72865
328121	5868031	Plus	153782-153850
328190	5868077	Plus	21082-21165
328227	5868105	Minus	21082-21242
327871	5868131	Minus	88889-89221
328018	5902482	Minus	542547-543133
328624	5868246	Minus	120666-120836
328744	5868290	Plus	138639-138722
328799	5868316	Minus	80771-80923
328291	5868363	Minus	144244-144434
328329	5868375	Plus	191709-192239
328369	5868388	Plus	75371-75583
328385	5868395	Plus	369952-370155
328397	5868397	Plus	344967-345063
328412	5868405	Plus	86427-86519
328538	5868485	Plus	3814-4243
328656	6004473	Plus	792616-792729
328638	6004473	Plus	294618-294903
328903	5868514	Plus	23625-24468
328960	6456775	Plus	38547-38837
330320	5932415	Minus	54458-54697
328993	5868536	Plus	49160-50084
329081	5868602	Plus	93368-93510
329089	5868614	Plus	25805-26923
329109	5868626	Plus	102168-102273
329192	5868716	Plus	166936-167020
329218	5868726	Minus	71408-71707
329224	5868728	Plus	27422-27664
329246	5868732	Minus	250541-250792
329415	5868874	Plus	1011438-1011818
329454	5868887	Plus	51342-51593

TABLE 15: 169 GENES WITH SEQUENCE INFORMATION DEPICTED IN TABLE 16

Table 15 depicts UnigeneID, UnigeneTitle, Primekey, Predicted Cellular Localization, and Exemplar Accession for all of the sequences in Table 16. The information in Table 15 is linked by EosCode to Table 16.

Pkey:	Unique Eos probeset identifier number
ExAccn:	Exemplar Accession number, Genbank accession number
UnigeneID:	Unigene number
Unigene Title:	Unigene gene title
EosCode:	Internal Eos name
Localization:	Predicted cellular localization of gene product

Pkey	ExAccn	UnigeneID	Unigene Title	EosCode	Localization
100394	D84276	Hs.66052	CD38 antigen (p45)	PBC1	plasma membrane
100452	D87742	Hs.241552	KIAA0268 protein	PAB7	not determined
101249	L33881	Hs.1904	protein kinase C, iota	OAA1	cytoplasmic
101485	M24736		selectin E (endothelial adhesion molecul	ACC5	plasma membrane
101514	M28214	Hs.123072	RAB3B, member RAS oncogene family	PFJ2	cytoplasmic
101851	M94250	Hs.82045	midkine (neurite growth-promoting factor	LBH9	secreted
102398	U42359		gb:Human N33 protein form 1 (N33) gene,	PDG3	
102522	U53347	Hs.183556	solute carrier family 1 (neutral amino a	PFJ4	plasma membrane
102669	U71207	Hs.29279	eyes absent (Drosophila) homolog 2	LEM9	cytoplasmic
103119	X63629	Hs.2877	cadherin 3, type 1, P-cadherin (placenta	LBG2	plasma membrane
103709	AA037316	Hs.13804	hypothetical protein dJ462O23.2	PDO6	
104080	AA402971	Hs.57771	kallikrein 11	PBA6	secreted
104144	AA447439	Hs.183390	hypothetical protein FLJ13590	PDM3	
104691	AA011176	Hs.37744	Homo sapiens beta-1 adrenergic receptor	PAV1	plasma membrane
105370	AA236476	Hs.22791	transmembrane protein with EGF-like and	PDM9	plasma membrane
106149	AA424881	Hs.256301	hypothetical protein MGC13170	PDO8	
106579	AA456135	Hs.23023	ESTs	PAA4	plasma membrane
107102	AA609723	Hs.30652	KIAA1344 protein	PAA3	not determined
107217	D51095		DKFZP586E1621 protein	PDG8	
108153	AA054237	Hs.40808	ESTs	PBF1	plasma membrane
109014	AA156790	Hs.262036	ESTs, Weakly similar to Z223_HUMAN ZINC	PDG7	
109112	AA169379	Hs.257924	hypothetical protein FLJ13782	BCU4	not determined
109890	H04649	Hs.20843	Homo sapiens cDNA FLJ11245 fis, clone PL	PDG4	
110151	H18836	Hs.31608	hypothetical protein FLJ20041	PAV9	plasma membrane
112971	T17185	Hs.83883	transmembrane, prostate androgen induced	CHA1	not determined
113021	T23855	Hs.129836	KIAA1028 protein	PDO3	
114908	AA236545	Hs.54973	cadherin-like protein VR20	PFJ6	plasma membrane
114965	AA250737	Hs.72472	ESTs	BCY2	mitochondrial
116393	AA599463		hypothetical protein MGC2648	PDV3	secreted
116416	AA609219	Hs.39982	ESTs	OAB6	
117698	N41002	Hs.45107	ESTs	PDT9	ER
117984	N51919	Hs.106778	ATPase, Ca++ transporting, type 2C, memb	PAJ5	not determined
118985	N94303	Hs.55028	ESTs, Weakly similar to I54374 gene NF2	PDM8	
119018	N95796	Hs.278695	Homo sapiens prostein mRNA, complete cds	PAB2	plasma membrane
119126	R45175	Hs.117183	ESTs	PBF8	
120992	AA398246	Hs.97594	KIAA1210 protein	PDG5	
121710	AA419011		prostate androgen-regulated transcript 1	PDV5	
121913	AA428062		ESTs; protease inhibitor 15 (PI15)	BCU7	vesicular
122041	AA431407	Hs.98732	Homo sapiens Chromosome 16 BAC clone CIT	PAZ1	not determined
122593	AA453310	Hs.128749	alpha-methylacyl-CoA racemase	PDO1	
123209	AA489711	Hs.203270	ESTs, Weakly similar to ALU1_HUMAN ALU S	PAA2	plasma membrane
124526	N62096	Hs.293185	ESTs, Weakly similar to JC7328 amino aci	PAV4	plasma membrane
126399	AA128075		transmembrane, prostate androgen induced	PDY4	
126645	AI167942	Hs.61635	six transmembrane epithelial antigen of	PAA5	plasma membrane
126966	R38438	Hs.182575	solute carrier family 15 (H+/peptide tra	PDO5	plasma membrane
127537	AA569531	Hs.162859	ESTs	PAA6	not determined
128790	AA291725	Hs.105700	secreted frizzled-related protein 4	BCX2	secreted
129109	AA491295	Hs.108708	calcium/calmodulin-dependent protein kin	PFJ7	
129184	W26769	Hs.109201	CGI-86 protein	PAV6	vesicular
129389	AA621604		spondin 2, extracellular matrix protein	CJA5	not determined

129404	AA172056		ESTs	PAB4	
129534	R73640	Hs.11260	hypothetical protein FLJ11264	PAJ3	secreted
130760	AA128997	Hs.18953	phosphodiesterase 9A	PEE6	nuclear
131425	AA219134	Hs.26691	ESTs	PBA7	
132964	AA031360		ESTs	PAA7	plasma membrane
132987	AA032221	Hs.61635	six transmembrane epithelial antigen of	PM17	plasma membrane
133179	U81599	Hs.66731	homeo box B13	PFJ5	nuclear
133330	U42360	Hs.71119	Putative prostate cancer tumor suppresso	PDM1	plasma membrane
133520	X74331	Hs.74519	primase, polypeptide 2A (58kD)	PDM2	
133724	U07919	Hs.75746	aldehyde dehydrogenase 1 family, member		PDT1 mitochondrial
133724	U07919	Hs.75746	aldehyde dehydrogenase 1 family, member		PDT1 mitochondrial
133944	AA045870	Hs.7780	Homo sapiens mRNA; cDNA DKFZp564A072 (fr		PAB9 cytoplasmic
134110	U41060	Hs.79136	LIV-1 protein, estrogen regulated	BCR4	plasma membrane
301805	AI800004	Hs.142846	hypothetical protein	PEU4	nuclear
302005	AI869666	Hs.123119	MAD (mothers against decapentaplegic, Dr	PBJ6	cytoplasmic
302881	AA508353	Hs.105314	relaxin 1 (H1)	PBH3	secreted
303506	AA340605	Hs.105887	ESTs, Weakly similar to Homolog of rat Z	PEG4	
303699	D30891	Hs.19525	hypothetical protein FLJ22794	PBM4	not determined
303753	AW503733	Hs.9414	KIAA1488 protein	PBY3	not determined
308050	AI460004	Hs.31608	hypothetical protein FLJ20041	PEU5	plasma membrane
310382	AI734009	Hs.127699	KIAA1603 protein	PCQ8	
310431	AI420227	Hs.149358	ESTs, Weakly similar to A46010 X-linked	PBH1	plasma membrane
310573	AW292180	Hs.156142	ESTs	PEN3	plasma membrane
310598	AI338013	Hs.140546	ESTs	PCW3	
310816	AI973051	Hs.224965	ESTs	PET5	
311596	AI682088	Hs.79375	holocarboxylase synthetase (biotin-[prop	PBH8	
313676	AA861697	Hs.120591	ESTs	PBY2	
314121	AI732100	Hs.187619	ESTs	PBY1	
314691	AW207206	Hs.136319	ESTs	BFF8	not determined
314785	AI538226	Hs.32976	guanine nucleotide binding protein 4	CBO7	cytoplasmic
314907	AI672225	Hs.222886	ESTs, Weakly similar to TRHY_HUMAN TRICH		PBM2not determined
315051	AW292425		ESTs	PBM9	
315052	AA876910	Hs.134427	ESTs	PBJ7	plasma membrane
316442	AA760894	Hs.153023	ESTs	PBJ9	
317548	AI654187	Hs.195704	ESTs	PBQ6	
317869	AW295184	Hs.129142	deoxyribonuclease II beta	PBQ7	
318524	AW291511	Hs.159066	hypothetical protein FLJ10188	PBJ1	cytoplasmic
319191	AF071538		prostate epithelium-specific Ets transcr	PEN1	
319763	AA460775	Hs.6295	ESTs, Weakly similar to T17248 hypotheti	PEO7	
320324	AF071202	Hs.139336	ATP-binding cassette, sub-family C (CFTR	PBH5	plasma membrane
320561	NM_006953	Hs.159330	uroplakin 3	PEL9	plasma membrane
320796	AF038966	Hs.31218	secretory carrier membrane protein 1	PBY4	not determined
321441	AW297633	Hs.118498	Homo sapiens LUCA-15 protein mRNA, splic		PBY8 not determined
322303	W07459	Hs.157601	ESTs	CBF9	secreted
322782	AA056060	Hs.202577	Homo sapiens cDNA FLJ12166 fis, clone MA		PBQ1not determined
322818	AW043782	Hs.293616	ESTs	PCQ7	plasma membrane
323226	AF055019	Hs.21906	Homo sapiens clone 24670 mRNA sequence		PCI2 not determined
323287	AA639902	Hs.104215	ESTs, Moderately similar to SPCN_HUMAN S		PBJ5
324295	AI146686	Hs.143691	ESTs	PBQ9	not determined
324430	AA464018	Hs.184598	Homo sapiens cDNA: FLJ23241 fis, clone C		PBY6 not determined
324603	AW016378	Hs.292934	ESTs	PBM3	
324617	AA508552	Hs.195839	ESTs, Weakly similar to I38022 hypotheti	PBH4	cytoplasmic
324626	AI685464		gb:tt88f04.x1 NCI_CGAP_Pr28 Homo sapiens		PCW6
324658	AI694767	Hs.129179	Homo sapiens cDNA FLJ13581 fis, clone PL		PBJ4 plasma membrane
324718	AI557019	Hs.116467	small nuclear protein PRAC	CBK1	nuclear
330211				PBJ2	not determined
330546	U31382	Hs.299867	guanine nucleotide binding protein 4	PEW1	cytoplasmic
330762	AA449677	Hs.15251	hypothetical protein	PBM1	not determined
330790	T48536	Hs.122764	TMPRSS2, transmembrane protease, serine		PEL3 plasma membrane
330892	AA149579	Hs.91202	ESTs	PBQ4	plasma membrane
331099	R36671	Hs.14846	Homo sapiens mRNA; cDNA DKFZp564D016 (fr		PCQ1cytoplasmic
331490	N32912	Hs.291039	ESTs	PCI4	nuclear
331689	AA431407	Hs.98802	ESTs, Moderately similar to T14342 NSD1	PBH7	not determined
332247	N58172		gb:za21f09.s1 Soares fetal liver spleen	PBQ5	nuclear
332396	AA340504		gb:hw31a09.x1 NCI_CGAP_Kid11 Homo sapien		PBJ8 not determined
332697	T94885		transgelin 2	PBQ8	secreted
332798				PBH2	nuclear
334447				PBY9	not determined
338255				PBY7	not determined

401424				PFG2	mitochondrial
407122	H20276	Hs.31742	ESTs	PEW7	
408430	S79876	Hs.44926	dipeptidylpeptidase IV (CD26, adenosine	PEZ3	plasma membrane
408826	AF216077	Hs.48376	Homo sapiens clone HB-2 mRNA sequence		PEY1
409262	AK000631	Hs.52256	hypothetical protein FLJ20624	PFG1	nuclear
409361	NM_005982	Hs.54416	sine oculis homeobox (Drosophila) homolo	PEW3	nuclear
411096	U80034	Hs.68583	mitochondrial intermediate peptidase	PEZ9	mitochondrial
413125	BE244589	Hs.75207	glyoxalase I	PFJ3	cytoplasmic
413623	AA825721	Hs.246973	ESTs	OBH6	
414422	AA147224	Hs.337232	Homeo box A13	PFC6	
415263	AA948033	Hs.130853	ESTs	PEZ5	
417153	X57010	Hs.81343	"collagen, type II, alpha 1 (primary ost	PFJ1	secreted
418601	AA279490	Hs.86368	calmegin	PFA1	ER
418848	AI820961	Hs.193465	ESTs	PEY4	
418882	NM_004996	Hs.89433	ATP-binding cassette, sub-family C (CFTR	OBH2	
419839	U24577	Hs.93304	"phospholipase A2, group VII (platelet-a	PFH9	secreted
421887	AW161450	Hs.109201	CGI-86 protein	PFH2	plasma membrane
422083	NM_001141	Hs.111256	"arachidonate 15-lipoxygenase, second ty	PFH5	cytoplasmic
424565	AW102723	Hs.75295	guanylate cyclase 1, soluble, alpha 3	PFA3	
425071	NM_013989	Hs.154424	"deiodinase, iodothyronine, type II"	PFH6	secreted
425710	AF030880		solute carrier family, member 4	PFD4	plasma membrane
427958	AA418000	Hs.98280	potassium intermediate/small conductance	PFH1	plasma membrane
428819	AL135623	Hs.193914	KIAA0575 gene product	PFD6	nuclear
429900	AA460421	Hs.30875	ESTs	PEZ7	
429918	AW873986	Hs.119383	ESTs	PEY5	
430226	BE245562	Hs.2551	adrenergic, beta-2-, receptor, surface	PEZ4	plasma membrane
431217	NM_013427	Hs.250830	Rho GTPase activating protein 6	PFG6	nuclear
431716	D89053	Hs.268012	fatty-acid-Coenzyme A ligase, long-chain	PEZ1	
431992	NM_002742	Hs.2891	protein kinase C, mu	PFH4	cytoplasmic
432189	AA527941		gb:nh30c04.s1 NCI_CGAP_Pr3 Homo sapiens		PFA2
432244	AI669973	Hs.200574	ESTs	PEW8	
432437	W07088	Hs.293685	ESTs	PFG3	
432966	AA650114	Hs.325198	ESTs	PEY3	
439176	AI446444	Hs.190394	ESTs, Weakly similar to B28096 line-1 pr	PEW5	
440260	AI972867	Hs.7130	copine IV	PEW6	
440901	AA909358	Hs.128612	ESTs	PFC8	
445424	AB028945		cortactin SH3 domain-binding protein	PEZ6	
446320	AF126245	Hs.14791	"acyl-Coenzyme A dehydrogenase family, m		PFH7
447210	AF035269		phosphatidylserine-specific phospholipas	PFH8	
449156	AF103907	Hs.171353	prostate cancer antigen 3, non-coding DD	PEZ8	
449625	NM_014253		odz (odd Oz/ten-m, Drosophila) homolog 1	PEZ2	plasma membrane
449650	AF055575	Hs.23838	calcium channel, voltage-dependent, L ty	PFD2	plasma membrane
451939	U80456	Hs.27311	single-minded (Drosophila) homolog 2	PFJ8	
451982	F13036	Hs.27373	Homo sapiens mRNA; cDNA DKFZp564O1763 (f		PFG9plasma membrane
452039	AI922988		ESTs	PFD8	
452340	NM_002202	Hs.505	ISL1 transcription factor, LIM/homeodoma	PFG4	nuclear
452784	BE463857	Hs.151258	hypothetical protein FLJ21062	PFC5	cytoplasmic
452946	X95425	Hs.31092	EphA5	PFH3	plasma membrane

TABLE 15A shows the accession numbers for those primekeys lacking a unigeneID in Table 15. For each probeset we have listed the gene cluster number from which the oligonucleotides were designed. Gene clusters were compiled using sequences derived from Genbank ESTs and mRNAs. These sequences were clustered based on sequence similarity using Clustering and Alignment Tools (DoubleTwist, Oakland California). The Genbank accession numbers for sequences comprising each cluster are listed in the "Accession" column.

Pkey: Unique Eos probeset identifier number
CAT number: Gene cluster number
Accession: Genbank accession numbers

Pkey	CAT number	Accession
116393	131543_1	AI972402 AI634409 AI523716 AI799749 W44518 AI424438 AI688513 AI971048 AI686324 AW013854 AA588483 AA528111 AI627428 AI582200 AI669296 AI826926 AI620526 AI669958 AI972458 AI924500 AA512903 W44517 AA335363 AW238997 BE300165 BE250665 AA284195 AA523420 W52834 AI471970 AI952824 AW003820 AW009463 AA669796 AA114966 AI653342 AA115038 AI342150 AI092100 AI968211 W51994 AI804005 AI201420 AI123210 AI738405 AI674984 AI970341 AW027500 AI493316 AI333193 AI139353 AA599463 AI656163 AI804200 AI365321 AI990213 AI657011 AA650025 AI968810 AI341978 AA599839 AW592602 AA644289 AI468578 AI565265 AI565228 BE221535 AW973052
101485	18113_1	AA296520 AL021940 M30640 NM_000450 M24736 M61894 AL047443 H39560 AI694691 AA916787 AI214796 AA939085 AI150616 AA412553 AA412545 AI051015 T27654 AA694430
126399	17331_1	AA088767 AF224278 AA128075 AL035541 AA027926 AI761441 AI972096 AW071693 AI742327 AI377498 AI804815 AI640802 AI885001 AI921394 AA595115 N71820 AI921217 AW007283 AI467828 AI369306 AA917446 AI493698 AA088701 AA126899 AI936228 AW204238 AI039567 AI925027 BE138909 AW452945 AW135998 AA310984 AA027860 AW073519 AI537597 AA953976 AI521341 AW273569 AW050740 AA536113 AA559064 AI474392 AW135709 AA535181 AW572959 AA570597 AI905464 AI677810 AI587642 AW975102 AA424310 AA482527 N64192 AA658276 AW889117 AA486591 AW889172 AI381990 AI381991 AI673419 AI990950 AA487031 AI272934 AI150565 AA229168 AW316722 AI142707 BE222398 AA614168 AA122028 AW338227 AA632457 AI968726 AW369662 AA512956 AA541675 AA451748 AI250993 BE146418 AA122025
132964	94346_1	AI362575 AI805082 AW263421 AI432462 AA135870 AA031360 AA031604 AA298475 AA298464
129389	21074_1	NM_012445 AB027466 BE407510 BE047605 AA047125 AW084003 AA149494 AA149490 AA292528 AA570505 AA526186 AW006250 AW007762 AI341557 AI799668 AI972710 AI377966 AI962810 AI084783 AI458032 AI190971 AW148913 AA372354 AW970032 AW007426 AA650188 AI123203 AI122890 AI280975 W73595 W73495 AI863238 AA374109 AA603986 AW149089 AW957523 AI307748 AI921067 AI336463 F24537 AI380460 AI367500 AI189309 AI814701 AI766921 AW572106 AA037024 AW072576 AA578293 AI288103 AA235464 AW450642 AA574230 AW294024 AI589229 AI580733 AW512227 AA877009 AI660255 AW188597 AA558228 AI572782 AA658397 AI274628 AI866359 AA864573 AI264439 AA621604 AW515493 AW243333 Z39737 AI567038 AA573997 AA573559 AW236431 AI652870 AI684973 AA034505 AA047126
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107217	9836_1	AL080235 AA031750 D81382 AI480231 AI095947 AI560953 BE010721 AI870290 AA374945 AA125792 D51527 D51556 AI685541 D51559 AW117286 AA195741 AI675138 AW593439 AI201885 T30590 AW952100 D51095 AA523864 W70043 AA987586 AI421515 AI205532 AA127069 AI337367 D51595 AI453785 AW075677 AW088359 C14287 C14284
121710	19266_1	AF163474 NM_016590 AF163475 AI761105 AI770098 AA410580 AA411616 AI590343 AI739050 AL050198 AI862645 AA419104 AA513809 AA333032 AI816915 AW139625 AA640889 AI311391 AI627693 AW135514 AA419011 AI269149 AI245259 AI970008 AI970017 AW139445 AA569503 AI761072 AI768179 AI759995 AI300776 AI870129 AW150770 AA226501 AA226220
121913	291015_1	AI249368 AI742316 AA428062 AA442089 AI864189 BE349478 AI803475 AI584049 BE552085 AI088609 AI264197 AI886144 AI129474 AI307145 BE181300 AW058403 AI696838 AW748598 AA442196 AI216428
102398	entrez_U42359	U42359
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324626	336411_1	AI685464 AW971336 AA513587 AA525142
319191	16065_1	NM_012391 AF071538 AB031549 AI685592 AI745526 AA662204 AW130657 AA662164 AW971121 AI668916 AA513274 AI991223 AI979170 AW298436 AA639821 AI859010 AW513942 AI687669 AA662521 AA548598 AI345056 AI305374 BE043418 AI432856 AI334840 AI379796 AI492693 AI307915 BE042082 AI307834 AI307858 AI309488 BE042210 AI435670 AI371605 AI862491 AI284563 AI306872 AI255044 AI254601 AI251236 AI473073 AI473042 AI432760 AI435664 AI336826 AI289365 AI369096 AI862274 AI334871 AI349863 AI250405 AI377617 AI309895 AI313017 AI862291 AI311936 AI378718 AI305722 AI306769 AI308888 AI334565 AI862296 AI344230 AI435685 AI344087 AI378696 AI311209 AI435775 AI310611 AI311154 AI432289 AI431561 AI492681 AI432867 AI335288 AI492796 AI432769 AI310299 AI432273 AI379820 AI275319 AI435753 AI609441 AI432767 AI369100 AI311420 AI349974 AI247157 AI334677 AI270910 AI224320 AI305608 AI334489 AI377152 AI350012 AI370086 AI335053 AI306781 AI306750 AI334849 AI334874 AI340380 AI307876 AI305974 AI305972 AI311521 AI334872 AI862509 AI311498 AI335051 AI289684 AI310859 AI311862 AI862483 AI492775 AI307906 AI492708 AI289693 AI340373 AI307910 AI311359 AI435653 AI334865 AI311492 AI492809 AI492690 AI431576 AI862268 AI311879 AI308435 AI492792 AI862512 AI275321 AI431568 AI431564 AI307885 AI307926 AI435692 AI435778 AI310182 AI308894 AI492707 AI492713 AI308560 AI307829 AI343234 AI580598 AW472786 AI340918 AI310243 AI309368 AI307920 AI289665

		AI306777 AW086318 AW086292 AW086378 AI310027 AI275293 AI369082 AI340900 AI306749 AI371558 AW086287 BE043803 AI306793 AI306272 AI287948 AI270917 AI284816 AI336813 AI284546 AI308044 AI275290 AI270872 AI306795 AI289687 AI223570 AI305303 AI289677 AI287742 AI275284 AI306812 AI336701 AI371554 AI378719 AI344988 AI223631 AI335141 AI343222 AI284568 AI305357 AI275270 AI345932 AI436549 AI307925 AI311502 AI344238 AI343182 AI308508 AI305988 AI270790 AI379792 AI305647 AI305410 AI432251 AI436517 AI343227 AI305534 AI340387 AI271043 AI305499 AI271046 AI305962 AI289465 AI305378 AI289725 AI310848 AI305848 AI289362 AI252964 AI307049 AI310831 AI306993 AI306796 AI224659 AI305969 AI349855 AI306164 AI306948 AI284676 AI309155 AI343202 AI432785 AI306815 AI369081 AI270885 AI289699 AI435704 AI309647 AI305716 AI311281 AI287927 AI472995 AI340423 AI270958 AI307069 AI305364 AI270807 AI275306 AI311890 AI275263 AI432750 AI289371 AI432881 AI255113 AI305709 AI473008 AI311168 AI309711 AI377164 AI271201 AI289560 AI309710 AI306195 AI311201 AI287741 AI271066 AI432876 AI275281 AI379795 AI472972 AI311967 AI306826 AI305465 AI270792 AI473019 AI305340 AI270922 AI305995 AI305462 AI254144 AI270969 AI473012 AI305390 AI275278 AI223644 AI289692 AI250318 AI305372 AI289691 AI250521 AI306283 AI306814 AI307933 AI473160 AI432903 AI223720 AI254979 AI334862 AI306926 AI289541 AI432248 AI435722 AI435698 AI432859 AI310683 AI473175 AI335144 AI289467 AI436489 AI306928 AI473033 AI305763 AI307868 AI307882 AI348959 AI435736 AI432857 AI432898 AI435735 AI432283 AI473086 AI432863 AI473081 AI432825 AI307840 AI473164 AI432885 AI473166 AI472982 AI435734 AI473060 AI473171 AI432279 AI432882 AI334670 AI436512 AI432827 AI432852 AI473051 AI473077 AI435697 AI271509 AI492781 AI472983 AI473018 AI432897 AI473043 AI432871 AI436536 AI473157 AI349715 AI432777 AI473016 AI473158 AI340369 AI307941 AI432773 AI377146 AI492791 AI270950 AI305342 AI284604 AI306269 AI284811 AI270811 AI289347 AI334869 AI334852 AI311759 AI250382 AI309520 AI289550 AI305721 AI340870 AI270901 AI308575 AI307904 AI340715 AI270941 AI309808 AI246867 AI473014 AI307039 AI289360 AI473069 AI492786 AI344013 AI305876 AI436510 AI340742 AI473028 AI307891 BE041871 BE041268 BE042340 BE041946 BE041783 AI306173 AI201948 AI926972 AI275769
338255	CH22_6856FG__LINK_EM:AC00	
330211	c_5_p2	
332798	CH22_14FG_6_5_LINK_C4G1.G	
334447	CH22_1746FG_387_7_LINK_EM	
332247	372969_1	AA669097 AA513815 AA026798 AA676526 AA704429 AA704269 AW118292 AA579216 N58172
332396	20265_1	AW579842 BE156562 BE156690 BE156489 BE081033 AK001559 BE149402 M85387 AW367811 AW367798 R17370 AI908947 AA382932 R58449 H18732 AA371231 AW962899 AA713530 AW892946 R53463 H11063 AW068542 Z40761 BE176212 BE176155 W23952 W92188 AW374883 AA303497 AW954769 AA036808 BE168063 AW382073 AW382085 AL041475 H80748 AI078161 BE463983 AI805213 AI761264 W94885 N94502 AI623772 AI419532 AI810302 AI634190 AW002516 AW150777 AI352312 AI367474 AW204807 AI675502 AI337026 AW134715 BE328451 AI123157 AI560020 AI300745 AI608631 AI248873 AA742484 AW051635 H18646 AI245045 AA507111 AI640510 AI925594 AA115747 AA143035 AA151106
332697	13699_1	X51405 NM_001873 T11322 AL118886 BE328175 AW136009 BE467445 AW470313 AA774852 BE504139 AW501046 AA082792 AW389231 AA370044 R36841 AA371457 C04813 R25791 R25556 AW895854 AW903819 AW895671 AW895677 BE159723 AW895664 AW895597 AW895595 AW895665 AW888518 AI903724 F06081 F08503 AL119462 AW895730 AW888516 R26511 R26489 AA334126 AA327626 N85713 AW895998 AA223822 F05468 AA370749 W05590 M78202 AA371073 AW498607 R15017 T16991 AA001282 AA001138 AA551566 AA330159 AI922855 AA383512 AA029603 D82246 D82171 T94933 H56545 AA348060 AA176888 R96764 AW451817 AA385766 AA452618 AI690057 AA988822 BE549928 AA150901 W57992 AW899925 C05281 AA932042 AA370980 AW962877 W04741 AA369982 AW385948 AA922468 N75882 AI422070 AI361256 AI680224 D57122 T94885 R53266 R46713 T19071 AW796277 AA325333 F04719 F02334 AA358146 AA626597 AA358304 AW028099 AL119570 D57290 D58273 D57796 N48555 AI361969 AA329457 D57225 AW024046 AA992606 AW022118 AW021538 AA935845 H89870 H56546 AW961219 AA453239 AW837541 N45521 BE218029 AA318877 AA327740 AW961809 T92139 D53216 D52365 D53363 D53312 D53116 AI547267 AA679935 AW026552 AW026418 AW190507 AI927710 AW244108 D50948 AW054991 AW021063 AW022511 AA493436 AI365636 BE464751 AW149384 AA102442 AW771368 AI818251 AI126368 D51049 AI421542 AI559467 AW079779 AW021048 AW023969 AW044214 AI458264 AA027274 AI620254 AW028917 BE219511 AA326242 N67561 AI971273 AA878328 D57131 AA770662 AI309299 AI796767 AA613338 W58076 AI566287 AI445573 AI880260 AA001919 AW339259 AI492610 AI492611 R97692 AI301425 AA722603 D58361 AI350323 AA973928 AI431263 AA516126 AA865467 AI925177 N39443 AA001943 AI299371 AI082412 AA665090 AA583433 H89871 AA977231 AI362219 AI056098 AI270446 N67524 N22103 AW614224 AA744054 AW243622 AI613188 AI929173 AI350243 AI362138 AA744004 AA176661 D56787 AI955625 AI393109 AI094769 AI479728 AI423107 AI955617 AI034036 AI582196 AW264534 AI418961 AA570761 AI343538 AA650341 AA992503 AA770004 AL039666 AI862675 AW190335 AA610274 AW418627 BE467472 D56786 T28749 AI217610 AI359556 T23523 AL040189 AA846222 AA651636 D51280 AI888986 AI521167 AI340177 AW612815 AI625285 AA621607 AA177059 AA229768 AA829788 AI749682 AW190631 N75299 AA230089 AI915632 BE069542 AA890020 AA528397 AA995390 BE503860 AA570812 AW339396 AI197986 AI203725 AI282379 AA670375 AA461513 F01728 AW243599 C00856 N75567 R95995 AA150932 R95961 AA648060 AA933800 AA927073 AA101126 AA864190 T93566 BE167472
425710	25529_1	AF030880 NM_000441 AC002467 AA385554 H23053 AW891838 AI139968 AA653057 AI695233
432189	342819_1	AA527941 AI810608 AI620190 AA635266
445424	6391_1	AB028945 T77648 F13328 AL157605 Z46212 AA304736 F11855 T66098 T30174 AW954164 AW176301 AW748243 AA456428 AI369958 AA938565 AW959613 Z42008 AA994779 AI683909 F11019 F10926 AI769597 AI752550 T65015 AI884314 AA643954 Z41838 AW020147 AI038822 AW571822 AA299781 AA894928 AF131790 BE005411 AI902476 AW082695 AA464384 R42750 AW902301 AA464273 R05837 Z38294 H41098 AL134507 M86079
447210	7119_1	AF035269 AF035268 NM_015900 T96213 U37591 AA156832 AA299371 AI084325 H95977 AI765967 BE221465 AA156726 AI969563 AW024539 AI436791 AI949451 AA843093 AI452756 AA824232 AI306667 T96131 AW207447 AW243556 AW957032 AI084332 H95978 U30998
449625	8113_1	NM_014253 AF100772 BE088769 AL022718 BE161779 AW863569 BE161640 AL039060 BE168542 AW296554 AA323193 AA235370 AW779760 N48874 AI375997 R45432 D59344 AI203107 F07491 R35360 R25094 AI913631 AI498402 T61382 AI016320 N45526 T61415 AA331486
452039	89513_1	AI922988 H05475 AA021608 AW169947 AA913750 Z41614 AW800012

TABLE 15B shows the genomic positioning for those primekeys lacking unigene ID's and accession numbers in Table 15. For each predicted exon, we have listed the genomic sequence source used for prediction. Nucleotide locations of each predicted exon are also listed.

Pkey: Unique number corresponding to an Eos probeset
Ref: Sequence source. The 7 digit numbers in this column are Genbank Identifier (GI) numbers. "Dunham I. et al." refers to the publication entitled "The DNA sequence of human chromosome 22." Dunham I. et al., Nature (1999) 402:489-495.
Strand: Indicates DNA strand from which exons were predicted.
Nt_position: Indicates nucleotide positions of predicted exons.

Pkey	Ref	Strand	Nt_position
334447	Dunham, I. et.al.	Plus	14308764-14308824
332798	Dunham, I. et.al.	Minus	232147-231974
338255	Dunham, I. et.al.	Minus	15242294-15242231
330211	6013592	Plus	59158-59215
401424	8176894	Plus	24223-24428

TABLE 11 AND SEQUENCE LISTING

SEQ ID NO:1 BCU4 DNA SEQUENCE

Nucleic Acid Accession #: NM_024915
Coding sequence: 13-1890 (underlined sequences correspond to start and stop codons)

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1         11        21        31        41        51
|         |         |         |         |         |
ATTGGATCAA ACATGTCACA AGAGTCGGAC AATAATAAAA GACTAGTGGC CTTAGTGCCC 60
ATGCCCAGTG ACCCTCCATT CAATACCCGA AGAGCCTACA CCAGTGAGGA TGAAGCCTGG 120
AAGTCATACT TGGAGAATCC CCTGACAGCA GCCACCAAGG CCATGATGAT CATTAATGGT 180
GATGAGGACA GTGCTGCTGC CCTCGGCCTG CTCTATGACT ACTACAAGGT TCCTCGAGAC 240
AAGAGGCTGC TGTCTGTAAG CAAAGCAAGT GACAGCCAAG AAGACCAGGA GAAAAGAAAC 300
TGCCTTGGCA CCAGTGAAGC CCAGAGTAAT TTGAGTGGAG GAGAAAACCG AGTGCAAGTC 360
CTAAAGACTG TTCCAGTGAA CCTTTCCCTA AATCAAGATC ACCTGGAGAA TTCCAAGCGG 420
GAACAGTACA GCATCAGCTT CCCCGAGAGC TCTGCCATCA TCCCGGTGTC GGGAATCACG 480
GTGGTGAAAG CTGAAGATTT CACACCAGTT TTCATGGCCC CACCTGTGCA CTATCCCCGG 540
GGAGATGGGG AAGAGCAACG AGTGGTTATC TTTGAACAGA CTCAGTATGA CGTGCCCTCG 600
CTGGCCACCC ACAGCGCCTA TCTCAAAGAC GACCAGCGCA GCACTCCGGA CAGCACATAC 660
AGCGAGAGCT TCAAGGACGC AGCCACAGAG AAATTTCGGA GTGCTTCAGT TGGGGCTGAG 720
GAGTACATGT ATGATCAGAC ATCAAGTGGC ACATTTCAGT ACACCCTGGA AGCCACCAAA 780
TCTCTCCGTC AGAAGCAGGG GGAGGGCCCC ATGACCTACC TCAACAAAGG ACAGTTCTAT 840
GCCATAACAC TCAGCGAGAC CGGAGACAAC AAATGCTTCC GACACCCCAT CAGCAAAGTC 900
AGGAGTGTGG TGATGGTGGT CTTCAGTGAA GACAAAAACA GAGATGAACA GCTCAAATAC 960
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TACAAGGAGA GCTTTAATAC GATTGGAAAC ATTGAAGAGA TTGCATATAA TGCTGTTTCC 1080
TTTACCTGGG ACGTGAATGA AGAGGCGAAG ATTTTCATCA CCGTGAATTG CTTGAGCACA 1140
GATTTCTCCT CCCAAAAAGG GGTGAAAGGA CTTCCTTTGA TGATTCAGAT TGACACATAC 1200
AGTTATAACA ATCGTAGCAA TAAACCCATT CATAGAGCTT ATTGCCAGAT CAAGGTCTTC 1260
TGTGACAAAG GAGCAGAAAG AAAAATCCGA GATGAAGAGC AGAAGCAGAA CAGGAAGAAC 1320
GGGAAAGGCC AGGCCTCCCA AACTCAATGC AACAGCTCCT CTGATGGGAA GTTGGCTGCC 1380
ATACCTTTAC AGAAGAAGAG TGACATCACC TACTTCAAAA CCATGCCTGA TCTCCACTCA 1440
CAGCCAGTTC TCTTCATACC TGATGTTCAC TTTGCAAACC TGCAGAGGAC CGGACAGGTG 1500
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GGCTTCAAGG TCACGCTCAT GGAAATCTAG CCCTGGGTTT GGCATCCGCT TTGGCTGGAG 1920
CTCTCAGTGC GTTCCTCCCT GAGAGAGACA GAAGCCCCAG CCCCAGAACC TGGAGACCCA 1980
TCTCCCCCAT CTCACAACTG CTGTTACAAG ACCGTGCTGG GGAGTGGGGC AAGGGACAGG 2040
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TTCTCACCCC TCCATATCTA TATCTCCCGA GTGGCTGGAC AAAATGAGCT ACGTCTGGGT 2340
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GCATTGTACA TAGTGTTTAT AATATTGTAA TAATATATTT TACCTGTGGT ATGTGGGCAT 2580
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CTCTGAGTCG GCAGACTGGG GCTTCCTCCT GGGCCACCAG ATGGAAAGGG GGTATTGTTT 3180
GCCTCACTCC TGGATGCTGC GTTTTAAGGA AGTGAGTGAG AAAGAATGTG CCAAGATACC 3240
TGGCTCCTGT GAAACCAGCC TCAGGAGGGA AACTGGGAGA GAGAAGCTGT GGTCTCCTGC 3300
TACATGCCCT GGGAGCTGGA AGAGAAAAAC ACTCCCCTAA ACAATCGCAA AATGATGAAC 3360
CATCATGGGC CACTGTTCTC TTTGAGGGGA CAGGTTTAGG GGTTTGCGTT CGCCCTTGTG 3420
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GGCCCAGATT TGTTTGTAAA GCACTTTGAC TCTTACCTGG AGGCCCGCTC TCTAAGGGCT 3540
TCCTGCGCTC CCACCTCATC TGTCCCTGAG ATGCAGAGCA GGATGGAGGG TCTGCTTCTA 3600
GCTCAGCTGT TTCTCCTTGA GGTTGCGGAG GAATTGAATT GAATGGGACA GAGGGCAGGT 3660
GCTGTGGCCA AGAAGATCTC CGAGCAGCAG TGACGGGGCA CCTTGCTGTG TGTCCTCTGG 3720
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TGTCCCCTCC TCCTCCACTC TGACTGCCAC GCCCCGGACC AGCAGCTTGG GGACCCTCCA 3840
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CTATGCACTT CCCATGCTCC TAGGGTTAGG AATAGTTTCA AACATGATTG GCAGACATAA 3960
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TGCCAGTCCT GCCCTAAGGC AGAAGATGAA TTGAAGATGC TGTGCATGTT TCCTAAGTCC 4140
TTGAGCAATC ATGGTGGTGA CAATTGCCAC AAGGATATG AGGCCAGTGC CACCAGAGGG 4200
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GCGAAACACT CCAAAGAGAT AGGAAAACTT GCCGCCTCTT CTTTTTTGTC CCTTAATCAA  4380
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TTCTTTTCTT TTTTTTTTTT TTTTTTTAAC AAAGTCTGAA CTGAACAGAA CAAGACTTTT  4500
TCCTCATACA TCTCCAAATT GTTTAAACTT ACTTTATGAG TGTTTGTTTA GAAGTTCGGA  4560
CCAACAGAAA AATGCAGTCA GATGTCATCT TGGAATTGGT TTCTAAAAGA GTAAGGCATG  4620
TCCCTGCCCA GAAACTTAGG AAGCATGAAA TAAATCAAAT GTTTATTTTC CTTCTTATTT  4680
AAAATCATGC TAATGCAACA GAAATAGAGG GTTTGTGCCA AATGCTATGA ACGGCCCTTT  4740
CTTAAAGACA AGCAAGGGAG ATTGATATAT GTACAATTTG CTCTCATGTT TTT
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SEQ ID NO:2 BCU4 Protein sequence:
Protein Accession #: NP_079191.1

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AAALGLLYDY YKVPRDKRLL SVSKASDSQE DQEKRNCLGT SEAQSNLSGG ENRVQVLKTV  120
PVNLSLNQDH LENSKREQYS ISFPESSAII PVSGITVVKA EDFTPVFMAP PVHYPRGDGE  180
EQRVVIFEQT QYDVPSLATH SAYLKDDQRS TPDSTYSESF KDAATEKFRS ASVGAEEYMY  240
DQTSSGTFQY TLEATKSLRQ KQGEGPMTYL NKGQFYAITL SETGDNKCFR HPISKVRSVV  300
MVVFSEDKNR DEQLKYWKYW HSRQHTAKQR VLDIADYKES FNTIGNIEEI AYNAVSFTWD  360
VNEEAKIFIT VNCLSTDFSS QKGVKGLPLM IQIDTYSYNN RSNKPIHRAY CQIKVFCDKG  420
AERKIRDEEQ KQNRKNGKGQ ASQTQCNSSS DGKLAAIPLQ KKSDITYFKT MPDLHSQPVL  480
FIPDVHFANL QRTGQVYYNT DDEREGGSVL VKRMFRPMEE EFGPVPSKQM KEEGTKRVLL  540
YVRKETDDVF DALMLKSPTV MGLMEAISEK YGLPVEKIAK LYKKSKKGIL VNMDDNIIEH  600
YSNEDTFILN MESMVEGFKV TLMEI
```

SEQ ID NO:3 BCU7 DNA SEQUENCE VARIANT 1:

Nucleic Acid Accession #: AA428062
Coding sequence: 1-777 (entire sequence represents open reading frame)

```
1          11         21         31         41         51
|          |          |          |          |          |
ATGATAGCAA TCTCTGCCGT CAGCAGTGCA CTCCTGTTCT CCCTTCTCTG TGAAGCAAGT    60
ACCGTCGTCC TACTCAATTC CACTGACTCA TCCCCGCCAA CCAATAATTT CACTGATATT   120
GAAGCAGCTC TGAAAGCACA ATTAGATTCA GCGGATATCC CCAAAGCCAG GCGGAAGCGC   180
TACATTTCGC AGAATGACAT GATCGCCATT CTTGATTATC ATAATCAAGT TCGGGGCAAA   240
GTGTTCCCAC CGGCAGCAAA TATGGAATAT ATGGTTTGGG ATGAAAATCT TGCAAAATCG   300
GCAGAGGCTT GGGCGGCTAC TTGCATTTGG GACCATGGAC CTTCTTACTT ACTGAGATTT   360
TTGGGCCAAA ATCTATCTGT ACGCACTGGA AGATATCGCT CTATTCTCCA GTTGGTCAAG   420
CCATGGTATG ATGAAGTGAA AGATTATGCT TTTCCATATC CCCAGGATTG CAACCCCAGA   480
TGTCCTATGA GATGTTTTGG TCCCATGTGC ACACATTATA CGCAGATGGT TTGGGCCACT   540
TCCAATCGGA TAGGATGCGC AATTCATGCT TGCCAAAACA TGAATGTTTG GGGATCTGTG   600
TGGCGACGTG CAGTTTACTT GGTATGCAAC TATGCCCCAA AGGGCAATTG GATTGGAGAA   660
GCACCATATA AAGTAGGGGT ACCATGTTCA TCTTGTCCTC CAAGTTATGG GGGATCTTGT   720
ACTGACAATC TGTGTTTTCC AGGAGTTACG TCAAACTACC TGTACTGGTT TAAATAA
```

SEQ ID NO:4 BCU7 DNA SEQUENCE VARIANT 2:

Nucleic Acid Accession #: AA428062
Coding sequence: 1-777 (entire sequence represents open reading frame)

```
1          11         21         31         41         51
|          |          |          |          |          |
ATGATAGCAA TCTCTGCCGT CAGCAGTGCA CTCCTGTTCT CCCTTCTCTG TGAAGCAAGT    60
ACCGTCGTCC TACTCAATTC CACTGACTCA TCCCCGCCAA CCAATAATTT CACTGATATT   120
GAAGCAGCTC TGAAAGCACA ATTAGATTCA GCGGATATCC CCAAAGCCAG GCGGAAGCGC   180
TACATTTCGC AGAATGACAT GATCGCCATT CTTGATTATC ATAATCAAGT TCGGGGCAAA   240
GTGTTCCCAC CGGCAGCAAA TATGGAATAT ATGGTTTGGG ATGAAAATCT TGCAAAATCG   300
GCAGAGGCTT GGGCGGCTAC TTGCATTTGG GACCATGGAC CTTCTTACTT ACTGAGATTT   360
TTGGGCCAAA ATCTATCTGT ACGCACTGGA AGATATCGCT CTATTCTCCA GTTGGTCAAG   420
CCATGGTATG ATGAAGTGAA AGATTATGCT TTTCCATATC CCCAGGATTG CAACCCCAGA   480
TGTCCTATGA GATGTTTTGG TCCCATGTGC ACACATTATA CGCAGATGGT TTGGGCCACT   540
TCCAATCGGA TAGGATGCGC AATTCATACT TGCCAAAACA TGAATGTTTG GGGATCTGTG   600
TGGCGACGTG CAGTTTACTT GGTATGCAAC TATGCCCCAA AGGGCAATTG GATTGGAGAA   660
GCACCATATA AAGTAGGGGT ACCATGTTCA TCTTGTCCTC CAAGTTATGG GGGATCTTGT   720
ACTGACAATC TGTGTTTTCC AGGAGTTACG TCAAACTACC TGTACTGGTT TAAATAA
```

SEQ ID NO:5 BCU7 Protein sequence Variant 1:
Protein Accession #: none

```
1          11         21         31         41         51
|          |          |          |          |          |
MIAISAVSSA LLFSLLCEAS TVVLLNSTDS SPPTNNFTDI EALKAQLDS  ADIPKARRKR    60
```

```
YISQNDMIAI LDYHNQVRGK VFPPAANMEY MVWDENLAKS AEAWAATCIW DHGPSYLLRF   120
LGQNLSVRTG RYRSILQLVK PWYDEVKDYA FPYPQDCNPR CPMRCFGPMC THYTQMVWAT   180
SNRIGCAIHA CQNMNVWGSV WRRAVYLVCN YAPKGNWIGE APYKVGVPCS SCPPSYGGSC   240
TDNLCFPGVT SNYLYWFK
```

SEQ ID NO:6 <u>BCU7 Protein sequence Variant 2:</u>
Protein Accession #: none

```
1          11         21         31         41         51
|          |          |          |          |          |
MIAISAVSSA LLFSLLCEAS TVVLLNSTDS SPPTNNFTDI EAALKAQLDS ADIPKARRKR    60
YISQNDMIAI LDYHNQVRGK VFPPAANMEY MVWDENLAKS AEAWAATCIW DHGPSYLLRF   120
LGQNLSVRTG RYRSILQLVK PWYDEVKDYA FPYPQDCNPR CPMRCFGPMC THYTQMVWAT   180
SNRIGCAIHT CQNMNVWGSV WRRAVYLVCN YAPKGNWIGE APYKVGVPCS SCPPSYGGSC   240
TDNLCFPGVT SNYLYWFK
```

SEQ ID NO:7 BCX2 DNA SEQUENCE

Nucleic Acid Accession #: NM_003014
Coding sequence: 238-1278 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
GGCGGGTTCG CGCCCCGAAG GCTGAGAGCT GGCGCTGCTC GTGCCCTGTG TGCCAGACGG   60
CGGAGCTCCG CGGCCGGACC CCGCGGCCCC GCTTTGCTGC CGACTGGAGT TTGGGGGAAG  120
AAACTCTCCT GCGCCCCAGA AGATTTCTTC CTCGGCGAAG GGACAGCGAA AGATGAGGGT  180
GGCAGGAAGA GAAGGCGCTT TCTGTCTGCC GGGGTCGCAG CGCGAGAGGG CAGTGCCATG  240
TTCCTCTCCA TCCTAGTGGC GCTGTGCCTG TGGCTGCACC TGGCGCTGGG CGTGCGCGGC  300
GCGCCCTGCG AGGCGGTGCG CATCCCTATG TGCCGGCACA TGCCCTGGAA CATCACGCGG  360
ATGCCCAACC ACCTGCACCA CAGCACGCAG GAGAACGCCA TCCTGGCCAT CGAGCAGTAC  420
GAGGAGCTGG TGGACGTGAA CTGCAGCGCC GTGCTGCGCT TCTTCTTCTG TGCCATGTAC  480
GCGCCCATTT GCACCCTGGA GTTCCTGCAC GACCCTATCA AGCCGTGCAA GTCGGTGTGC  540
CAACGCGCGC GCGACGACTG CGAGCCCCTC ATGAAGATGT ACAACCACAG CTGGCCCGAA  600
AGCCTGGCCT GCGACGAGCT GCCTGTCTAT GACCGTGGCG TGTGCATTTC GCCTGAAGCC  660
ATCGTCACGG ACCTCCCGGA GGATGTTAAG TGGATAGACA TCACACCAGA CATGATGGTA  720
CAGGAAAGGC CTCTTGATGT TGACTGTAAA CGCCTAAGCC CCGATCGGTG CAAGTGTAAA  780
AAGGTGAAGC CAACTTTGGC AACGTATCTC AGCAAAAACT ACAGCTATGT TATTCATGCC  840
AAAATAAAAG CTGTGCAGAG GAGTGGCTGC AATGAGGTCA CAACGGTGGT GGATGTAAAA  900
GAGATCTTCA AGTCCTCATC ACCCATCCCT CGAACTCAAG TCCCGCTCAT TACAAATTCT  960
TCTTGCCAGT GTCCACACAT CCTGCCCCAT CAAGATGTTC TCATCATGTG TTACGAGTGG 1020
CGTTCAAGGA TGATGCTTCT TGAAAATTGC TTAGTTGAAA AATGGAGAGA TCAGCTTAGT 1080
AAAAGATCCA TACAGTGGGA AGAGAGGCTG CAGGAACAGC GGAGAACAGT TCAGGACAAG 1140
AAGAAAACAG CCGGGCGCAC CAGTCGTAGT AATCCCCCCA AACCAAAGGG AAAGCCTCCT 1200
GCTCCCAAAC CAGCCAGTCC CAAGAAGAAC ATTAAAACTA GGAGTGCCCA GAAGAGAACA 1260
AACCCGAAAA GAGTGTGAGC TAACTAGTTT CCAAAGCGGA GACTTCCGAC TTCCTTACAG 1320
GATGAGGCTG GGCATTGCCT GGGACAGCCT ATGTAAGGCC ATGTGCCCCT TGCCCTAACA 1380
ACTCACTGCA GTGCTCTTCA TAGACACATC TTGCAGCATT TTTCTTAAGG CTATGCTTCA 1440
GTTTTTCTTT GTAAGCCATC ACAAGCCATA GTGGTAGGTT TGCCCTTTGG TACAGAAGGT 1500
GAGTTAAAGC TGGTGGAAAA GGCTTATTGC ATTGCATTCA GAGTAACCTG TGTGCATACT 1560
CTAGAAGAGT AGGGAAAATA ATGCTTGTTA CAATTCGACC TAATATGTGC ATTGTAAAAT 1620
AAATGCCATA TTTCAAACAA AACACGTAAT TTTTTTACAG TATGTTTTAT TACCTTTTGA 1680
TATCTGTTGT TGCAATGTTA GTGATGTTTT AAAATGTGAT GAAAATATAA TGTTTTTAAG 1740
AAGGAACAGT AGTGGAATGA ATGTTAAAAG ATCTTTATGT GTTTATGGTC TGCAGAAGGA 1800
TTTTTGTGAT GAAAGGGGAT TTTTTGAAAA ATTAGAGAAG TAGCATATGG AAAATTATAA 1860
TGTGTTTTTT TACCAATGAC TTCAGTTTCT GTTTTTAGCT AGAAACTTAA AAACAAAAAT 1920
AATAATAAAG AAAAATAAAT AAAAAGGAGA GGCAGACAAT GTCTGGATTC CTGTTTTTTG 1980
GTTACCTGAT TTCCATGATC ATGATGCTTC TTGTCAACAC CCTCTTAAGC AGCACCAGAA 2040
ACAGTGAGTT TGTCTGTACC ATTAGGAGTT AGGTACTAAT TAGTTGGCTA ATGCTCAAGT 2100
ATTTTATACC CACAAGAGAG GTATGTCACT CATCTTACTT CCCAGGACAT CCACCCTGAG 2160
AATAATTTGA CAAGCTTAAA AATGGCCTTC ATGTGAGTGC CAAATTTTGT TTTTCTTCAT 2220
TTAAATATTT TCTTTGCCTA AATACATGTG AGAGGAGTTA AATATAAATG TACAGAGAGG 2280
AAAGTTGAGT TCCACCTCTG AAATGAGAAT TACTTGACAG TTGGGATACT TTAATCAGAA 2340
AAAAAGAACT TATTTGCAGC ATTTTATCAA CAAATTTCAT AATTGTGGAC AATTGGAGGC 2400
ATTTATTTTA AAAAACAATT TTATTGGCCT TTTGCTAACA CAGTAAGCAT GTATTTTATA 2460
AGGCATTCAA TAAATGCACA ACGCCCAAAG GAAATAAAAT CCTATCTAAT CCTACTCTCC 2520
ACTACACAGA GGTAATCACT ATTAGTATTT TGGCATATTA TTCTCCAGGT GTTTGCTTAT 2580
GCACTTATAA AATGATTTGA ACAAATAAAA CTAGGAACCT GTATACATGT GTTTCATAAC 2640
CTGCCTCCTT TGCTTGGCCC TTTATTGAGA TAAGTTTTCC TGTCAAGAAA GCAGAAACCA 2700
TCTCATTTCT AACAGCTGTG TTATATTCCA TAGTATGCAT TACTCAACAA ACTGTTGTGC 2760
TATTGGATAC TTAGGTGGTT TCTTCACTGA CAATACTGAA TAAACATCTC ACCGGAATTC
```

SEQ ID NO:8 <u>BCX2 Protein sequence:</u>
Protein Accession #: NP_003005.1

```
1          11         21         31         41         51
|          |          |          |          |          |
MFLSILVALC LWLHLALGVR GAPCEAVRIP MCRHMPWNIT RMPNHLHHST QENAILAIEQ    60
```

```
YEELVDVNCS AVLRFFFCAM YAPICTLEFL HDPIKPCKSV CQRARDDCEP LMKMYNHSWP  120
ESLACDELPV YDRGVCISPE AIVTDLPEDV KWIDITPDMM VQERPLDVDC KRLSPDRCKC  180
KKVKPTLATY LSKNYSYVIH AKIKAVQRSG CNEVTTVVDV KEIFKSSSPI PRTQVPLITN  240
SSCQCPHILP HQDVLIMCYE WRSRMMLLEN CLVEKWRDQL SKRSIQWEER LQEQRRTVQD  300
KKKTAGRTSR SNPPKPKGKP PAPKPASPKK NIKTRSAQKR TNPKRV
```

SEQ ID NO:9 CBK1 DNA SEQUENCE

Nucleic Acid Accession #: NM_032391
Coding sequence: 129-302 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
GTCCTTCCTC TCCTAGCCTA AGGCGTGCAA ACAGAGCGCC ACTGGGAGGC TGAAACCTTT    60
AGGCCGATGC TTGCTTGCAA GGTCAGGCAA GCTGGATTCT GGTCCCCACC TTTGCAGAGA   120
GAACAGCGAT GTTGTGCGCC CATTTCTCAG ATCAAGGACC GGCCCATCTT ACTACCTCCA   180
AGAGTGCTTT TCTCTCTAAT AAGAAAACAT CTACTTTGAA ACATCTACTG GGCGAGACCA   240
GGAGTGATGG CTCAGCCTGT AATTCTGGAA TTTCGGGAGG CCGAGGCAGG AAGATTCCTT   300
GAGCACAGGA GTTCCAGACC AGCCTGGGCA ATGTAGCAAG ACGCTGTCTC TATTTATACA   360
ATAAAATTTT TTTAAAAAAG G
```

SEQ ID NO:10 <u>CBK1 Protein sequence:</u>
Protein Accession #: NP_115767

```
1          11         21         31         41         51
|          |          |          |          |          |
MLCAHFSDQG PAHLTTSKSA FLSNKKTSTL KHLLGETRSD GSACNSGISG GRGRKIP
```

SEQ ID NO:11 CHA1 DNA SEQUENCE

Nucleic Acid Accession #: NM_020182
Coding sequence: 96-854 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
TCCTTGGGTT CGGGTGAAAG CGCCTGGGGG TTCGTGGCCA TGATCCCCGA GCTGCTGGAG    60
AACTGAAGGC GGACAGTCTC CTGCGAAACC AGGCAATGGC GGAGCTGGAG TTTGTTCAGA   120
TCATCATCAT CGTGGTGGTG ATGATGGTGA TGGTGGTGGT GATCACGTGC CTGCTGAGCC   180
ACTACAAGCT GTCTGCACGG TCCTTCATCA GCCGGCACAG CCAGGGGCGG AGGAGAGAAG   240
ATGCCCTGTC CTCAGAAGGA TGCCTGTGGC CCTCGGAGAG CACAGTGTCA GGCAACGGAA   300
TCCCAGAGCC GCAGGTCTAC GCCCCGCCTC GGCCCACCGA CCGCCTGGCC GTGCCGCCCT   360
TCGCCCAGCG GGAGCGCTTC CACCGCTTCC AGCCCACCTA TCCGTACCTG CAGCACGAGA   420
TCGACCTGCC ACCCACCATC TCGCTGTCAG ACGGGGAGGA GCCCCCACCC TACCAGGGCC   480
CCTGCACCCT CCAGCTTCGG GACCCCGAGC AGCAGCTGGA ACTGAACCGG GAGTCGGTGC   540
GCGCACCCCC AAACAGAACC ATCTTCGACA GTGACCTGAT GGATAGTGCC AGGCTGGGCG   600
GCCCCTGCCC CCCCAGCAGT AACTCGGGCA TCAGCGCCAC GTGCTACGGC AGCGGCGGGC   660
GCATGGAGGG GCCGCCGCCC ACCTACAGCG AGGTCATCGG CCACTACCCG GGGTCCTCCT   720
TCCAGCACCA GCAGAGCAGT GGGCCGCCCT CCTTGCTGGA GGGGACCCGG CTCCACCACA   780
CACACATCGC GCCCCTAGAG AGCGCAGCCA TCTGGAGCAA AGAGAAGGAT AAACAGAAAG   840
GACACCCTCT CTAGGGTCCC CAGGGGGGCC GGGCTGGGGC TGCGTAGGTG AAAAGGCAGA   900
ACACTCCGCG CTTCTTAGAA GAGGAGTGAG AGGAAGGCGG GGGGCGCAGC AACGCATCGT   960
GTGGCCCTCC CCTCCCACCT CCCTGTGTAT AAATATTTAC ATGTGATGTC TGGTCTGAAT  1020
GCACAAGCTA AGAGAGCTTG CAAAAAAAAA AAGAAAAAAG AAAAAAAAAA ACCACGTTTC  1080
TTTGTTGAGC TGTGTCTTGA AGGCAAAAGA AAAAAAATTT CTACAGTAAA AAAAAAAAAA  1140
A
```

SEQ ID NO:12 <u>CHA1 Protein sequence:</u>
Protein Accession #: NP_064567

```
1          11         21         31         41         51
|          |          |          |          |          |
MAELEFVQII IIVVVMMVMV VVITCLLSHY KLSARSFISR HSQGRRREDA LSSEGCLWPS    60
ESTVSGNGIP EPQVYAPPRP TDRLAVPPFA QRERFHRFQP TYPYLQHEID LPPTISLSDG   120
EEPPPYQGPC TLQLRDPEQQ LELNRESVRA PPNRTIFDSD LMDSARLGGP CPPSSNSGIS   180
ATCYGSGGRM EGPPPTYSEV IGHYPGSSFQ HQQSSGPPSL LEGTRLHHTH IAPLESAAIW   240
SKEKDKQKGH PL
```

SEQ ID NO:13 CJA5 DNA SEQUENCE

Nucleic Acid Accession #: NM_012445
Coding sequence: 276-1271 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
```

```
GCACGAGGGA AGAGGGTGAT CCGACCCGGG GAAGGTCGCT GGGCAGGGCG AGTTGGGAAA    60
GCGGCAGCCC CCGCCGCCCC CGCAGCCCCT TCTCCTCCTT TCTCCCACGT CCTATCTGCC   120
TCTCGCTGGA GGCCAGGCCG TGCAGCATCG AAGACAGGAG GAACTGGAGC CTCATTGGCC   180
GGCCCGGGGC GCCGGCCTCG GGCTTAAATA GGAGCTCCGG GCTCTGGCTG GGACCCGACC   240
GCTGCCGGCC GCGCTCCCGC TGCTCCTGCC GGGTGATGGA AAACCCCAGC CCGGCCGCCG   300
CCCTGGGCAA GGCCCTCTGC GCTCTCCTCC TGGCCACTCT CGGCGCCGCC GGCCAGCCTC   360
TTGGGGGAGA GTCCATCTGT TCCGCCAGAG CCCCGGCCAA ATACAGCATC ACCTTCACGG   420
GCAAGTGGAG CCAGACGGCC TTCCCCAAGC AGTACCCCCT GTTCCGCCCC CCTGCGCAGT   480
GGTCTTCGCT GCTGGGGGCC GCGCATAGCT CCGACTACAG CATGTGGAGG AAGAACCAGT   540
ACGTCAGTAA CGGGCTGCGC GACTTTGCGG AGCGCGGCGA GGCCTGGGCG CTGATGAAGG   600
AGATCGAGGC GGCGGGGGAG GCGCTGCAGA GCGTGCACGC GGTGTTTTCG GCGCCCGCCG   660
TCCCCAGCGG CACCGGGCAG ACGTCGGCGG AGCTGGAGGT GCAGCGCAGG CACTCGCTGG   720
TCTCGTTTGT GGTGCGCATC GTGCCCAGCC CCGACTGGTT CGTGGGCGTG GACAGCCTGG   780
ACCTGTGCGA CGGGGACCGT TGGCGGGAAC AGGCGGCGCT GGACCTGTAC CCCTACGACG   840
CCGGGACGGA CAGCGGCTTC ACCTTCTCCT CCCCCAACTT CGCCACCATC CCGCAGGACA   900
CGGTGACCGA GATAACGTCC TCCTCTCCCA GCCACCCGGC CAACTCCTTC TACTACCCGC   960
GGCTGAAGGC CCTGCCTCCC ATCGCCAGGG TGACACTGGT GCGGCTGCGA CAGAGCCCCA  1020
GGGCCTTCAT CCCTCCCGCC CCAGTCCTGC CCAGCAGGGA CAATGAGATT GTAGACAGCG  1080
CCTCAGTTCC AGAAACGCCG CTGGACTGCG AGGTCTCCCT GTGGTCGTCC TGGGGACTGT  1140
GCGGAGGCCA CTGTGGGAGG CTCGGGACCA AGAGCAGGAC TCGCTACGTC CGGGTCCAGC  1200
CCGCCAACAA CGGGAGCCCC TGCCCCGAGC TCGAAGAAGA GGCTGAGTGC GTCCCTGATA  1260
ACTGCGTCTA AGACCAGAGC CCCGCAGCCC CTGGGGCCCC CGGAGCCATG GGGTGTCGGG  1320
GGCTCCTGTG CAGGCTCATG CTGCAGGCGG CCGAGGCACA GGGGGTTTCG CGCTGCTCCT  1380
GACCGCGGTG AGGCCGCGCC GACCATCTCT GCACTGAAGG GCCCTCTGGT GGCCGGCACG  1440
GGCATTGGGA AACAGCCTCC TCCTTTCCCA ACCTTGCTTC TTAGGGGCCC CCGTGTCCCG  1500
TCTGCTCTCA GCCTCCTCCT CCTGCAGGAT AAAGTCATCC CCAAGGCTCC AGCTACTCTA  1560
AATTATGGTC TCCTTATAAG TTATTGCTGC TCCAGGAGAT TGTCCTTCAT CGTCCAGGGG  1620
CCTGGCTCCC ACGTGGTTGC AGATACCTCA GACCTGGTGC TCTAGGCTGT GCTGAGCCCA  1680
CTCTCCCGAG GGCGCATCCA AGCGGGGGCC ACTTGAGAAG TGAATAAATG GGCGGTTTC   1740
GGAAGCGTCA GTGTTTCCAT GTTATGGATC TCTCTGCGTT TGAATAAAGA CTATCTCTGT  1800
TGCTCAC
```

SEQ ID NO:14 CJA5 Protein sequence:
Protein Accession #: NP_036577

```
1          11         21         31         41         51
|          |          |          |          |          |
MENPSPAAAL GKALCALLLA TLGAAGQPLG GESICSARAP AKYSITFTGK WSQTAFPKQY    60
PLFRPPAQWS SLLGAAHSSD YSMWRKNQYV SNGLRDFAER GEAWALMKEI EAAGEALQSV   120
HAVFSAPAVP SGTGQTSAEL EVQRRHSLVS FVVRIVPSPD WFVGVDSLDL CDGDRWREQA   180
ALDLYPYDAG TDSGFTFSSP NFATIPQDTV TEITSSSPSH PANSFYYPRL KALPPIARVT   240
LVRLRQSPRA FIPPAPVLPS RDNEIVDSAS VPETPLDCEV SLWSSWGLCG GHCGRLGTKS   300
RTRYVRVQPA NNGSPCPELE EEAECVPDNC V
```

SEQ ID NO:15 LBH9 DNA SEQUENCE

Nucleic Acid Accession #: NM_002391
Coding sequence: 26-457 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
CGGGCGAAGC AGCGCGGGCA GCGAGATGCA GCACCGAGGC TTCCTCCTCC TCACCCTCCT    60
CGCCCTGCTG GCGCTCACCT CCGCGGTCGC CAAAAAGAAA GATAAGGTGA AGAAGGGCGG   120
CCCGGGGAGC GAGTGCGCTG AGTGGGCCTG GGGGCCCTGC ACCCCCAGCA GCAAGGATTG   180
CGGCGTGGGT TTCCGCGAGG GCACCTGCGG GGCCCAGACC CAGCGCATCC GGTGCAGGGT   240
GCCCTGCAAC TGGAAGAAGG AGTTTGGAGC CGACTGCAAG TACAAGTTTG AGAACTGGGG   300
TGCGTGTGAT GGGGGCACAG GCACCAAAGT CCGCCAAGGC ACCCTGAAGA AGGCGCGCTA   360
CAATGCTCAG TGCCAGGAGA CCATCCGCGT CACCAAGCCC TGCACCCCCA AGACCAAAGC   420
AAAGGCCAAA GCCAAGAAAG GGAAGGGAAA GGACTAGACG CCAAGCCTGG ATGCCAAGGA   480
GCCCCTGGTG TCACATGGGG CCTGGCCACG CCCTCCCTCT CCCAGGCCCG AGATGTGACC   540
CACCAGTGCC TTCTGTCTGC TCGTTAGCTT TAATCAATCA TGCCCTGCCT TGTCCCTCTC   600
ACTCCCCAGC CCCACCCCTA AGTGCCCAAA GTGGGGAGGG ACAAGGGATT CTGGGAAGCT   660
TGAGCCTCCC CCAAAGCAAT GTGAGTCCCA GAGCCCGCTT TTGTTCTTCC CCACAATTCC   720
ATTACTAAGA AACACATCAA ATAAACTGAC TTTTTCCCCC CAATAAAAGC TCTTCTTTTT   780
TAATAT
```

SEQ ID NO:16 LBH9 Protein sequence:
Protein Accession #: NP_002382

```
1          11         21         31         41         51
|          |          |          |          |          |
MQHRGFLLLT LLALLALTSA VAKKKDKVKK GGPGSECAEW AWGPCTPSSK DCGVGFREGT    60
CGAQTQRIRC RVPCNWKKEF GADCKYKFEN WGACDGGTGT KVRQGTLKKA RYNAQCQETI   120
RVTKPCTPKT KAKAKAKKGK GKD
```

SEQ ID NO:17 LEM9 DNA SEQUENCE

Nucleic Acid Accession #: NM_005244
Coding sequence: 1-1617 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
ATGGTAGAAC TAGTGATCTC ACCCAGCCTC ACTGTAAACA GCGATTGTCT GGATAAACTG    60
AAGTTTAACC GTGCTGACGC TGCTGTGTGG ACTCTGAGTG ACAGACAAGG CATCACCAAA   120
TCGGCCCCCC TGAGAGTGTC CCAGCTCTTC TCCAGATCTT GCCCACGTGT CCTCCCCCGC   180
CAGCCTTCCA CAGCCATGGC AGCCTACGGC CAGACGCAGT ACAGTGCGGG GATCCAGCAG   240
GCTACCCCCT ATACAGCTTA CCCACCTCCA GCACAAGCCT ATGGAATCCC TTCCTACAGC   300
ATCAAGACAG AAGACAGCTT GAACCATTCC CCTGGCCAGA GTGGATTCCT CAGCTATGGC   360
TCCAGCTTCA GCACCTCACC CACTGGACAG AGCCCATACA CCTACCAGAT GCACGGCACA   420
ACAGGGTTCT ATCAAGGAGG AAATGGACTG GGCAACGCAG CCGGTTTCGG GAGTGTGCAC   480
CAGGACTATC CTTCCTACCC CGGCTTCCCC CAGAGCCAGT ACCCCCAGTA TTACGGCTCA   540
TCCTACAACC CTCCCTACGT CCCGGCCAGC AGCATCTGCC CTTCGCCCCT CTCCACGTCC   600
ACCTACGTCC TCCAGGAGGC ATCTCACAAC GTCCCCAACC AGAGTTCCGA GTCACTTGCT   660
GGTGAATACA ACACACACAA TGGACCTTCC ACACCAGCGA AAGAGGGAGA CACAGACAGG   720
CCGCACCGGG CCTCCGACGG GAAGCTCCGA GGCCGGTCTA AGAGGAGCAG TGACCCGTCC   780
CCGGCAGGGG ACAATGAGAT TGAGCGTGTG TTCGTGTGGG ACTTGGATGA GACAATAATT   840
ATTTTTCACT CCTTACTCAC GGGGACATTT GCATCCAGAT ACGGGAAGGA CACCACGACG   900
TCCGTGCGCA TTGGCCTTAT GATGGAAGAG ATGATCTTCA ACCTTGCAGA TACACATCTG   960
TTCTTCAATG ACCTGGAGGA TTGTGACCAG ATCCACGTTG ATGACGTCTC ATCAGATGAC  1020
AATGGCCAAG ATTTAAGCAC ATACAACTTC TCCGCTGACG GCTTCCACAG TTCGGCCCCA  1080
GGAGCCAACC TGTGCCTGGG CTCTGGCGTG CACGGCGGCG TGGACTGGAT GAGGAAGCTG  1140
GCCTTCCGCT ACCGGCGGGT GAAGGAGATG TACAATACCT ACAAGAACAA CGTTGGTGGG  1200
TTGATAGGCA CTCCCAAAAG GGAGACCTGG CTACAGCTCC GAGCTGAGCT GGAAGCTCTC  1260
ACAGACCTCT GGCTGACCCA CTCCCTGAAG GCACTAAACC TCATCAACTC CCGGCCCAAC  1320
TGTGTCAATG TGCTGGTCAC CACCACTCAA CTAATTCCTG CCCTGGCCAA AGTCCTGCTA  1380
TATGGCCTGG GGTCTGTGTT TCCTATTGAG AACATCTACA GTGCAACCAA GACAGGGAAG  1440
GAGAGCTGCT TCGAGAGGAT AATGCAGAGA TTCGGCAGAA AAGCTGTCTA CGTGGTGATC  1500
GGTGATGGTG TGGAAGAGGA GCAAGGAGCG AAAAAGCACA ACATGCCTTT CTGGCGGATA  1560
TCCTGCCACG CAGACCTGGA GGCACTGAGG CACGCCCTGG AACTGGAGTA TTTATAG
```

SEQ ID NO:18 LEM9 Protein sequence:
Protein Accession #: NP_005235

```
1          11         21         31         41         51
|          |          |          |          |          |
MVELVISPSL TVNSDCLDKL KFNRADAAVW TLSDRQGITK SAPLRVSQLF SRSCPRVLPR    60
QPSTAMAAYG QTQYSAGIQQ ATPYTAYPPP AQAYGIPSYS IKTEDSLNHS PGQSGFLSYG   120
SSPSTSPTGQ SPYTYQMHGT TGFYQGGNGL GNAAGFGSVH QDYPSYPGFP QSQYPQYYGS   180
SYNPPYVPAS SICPSPLSTS TYVLQEASHN VPNQSSESLA GEYNTHNGPS TPAKEGDTDR   240
PHRASDGKLR GRSKRSSDPS PAGDNEIERV FVWDLDETII IFHSLLTGTF ASRYGKDTTT   300
SVRIGLMMEE MIFNLADTHL FFNDLEDCDQ IHVDDVSSDD NGQDLSTYNF SADGFHSSAP   360
GANLCLGSGV HGGVDWMRKL AFRYRRVKEM YNTYKNNVGG LIGTPKRETW LQLRAELEAL   420
TDLWLTHSLK ALNLINSRPN CVNVLVTTTQ LIPALAKVLL YGLGSVFPIE NIYSATKTGK   480
ESCFERIMQR FGRKAVYVVI GDGVEEEQGA KKHNMPFWRI SCHADLEALR HALELEYL
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SEQ ID NO:19 OAA1 DNA SEQUENCE

Nucleic Acid Accession #: NM_002740
Coding sequence: 178-1968 (underlined sequences correspond to start and stop codons)

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AGGTAGGTGG GCGGACGGCC GCGGTTCTCC GGCAAGCGCA GGCGGCGGAG TCCCCCACGG   120
CGCCCGAAGC GCCCCCCGCA CCCCCGGCCT CCAGCGTTGA GGCGGGGGAG TGAGGAGATG   180
CCGACCCAGA GGGACAGCAG CACCATGTCC CACACGGTCG CAGGCGGCGG CAGCGGGGAC   240
CATTCCCACC AGGTCCGGGT GAAAGCCTAC TACCGCGGGG ATATCATGAT AACACATTTT   300
GAACCTTCCA TCTCCTTTGA GGGCCTTTGC AATGAGGTTC GAGACATGTG TTCTTTTGAC   360
AACGAACAGC TCTTCACCAT GAAATGGATA GATGAGGAAG GAGACCCGTG TACAGTATCA   420
TCTCAGTTGG AGTTAGAAGA AGCCTTTAGA CTTTATGAGC TAAACAAGGA TTCTGAACTC   480
TTGATTCATG TGTTCCCTTG TGTACCAGAA CGTCCTGGGA TGCCTTGTCC AGGAGAAGAT   540
AAATCCATCT ACCGTAGAGG TGCACGCCGC TGGAGAAAGC TTTATTGTGC CAATGGCCAC   600
ACTTTCCAAG CCAAGCGTTT CAACAGGCGT GCTCACTGTG CCATCTGCAC AGACCGAATA   660
TGGGGACTTG GACGCCAAGG ATATAAGTGC ATCAACTGCA AACTCTTGGT TCATAAGAAG   720
TGCCATAAAC TCGTCACAAT TGAATGTGGG CGGCATTCTT TGCCACAGGA ACCAGTGATG   780
CCCATGGATC AGTCATCCAT GCATTCTGAC CATGCACAGA CAGTAATTCC ATATAATCCT   840
TCAAGTCATG AGAGTTTGGA TCAAGTTGGT GAAGAAAAAG AGGCAATGAA CACCAGGGAA   900
AGTGGCAAAG CTTCATCCAG TCTAGGTCTT CAGGATTTTG ATTTGCTCCG GGTAATAGGA   960
AGAGGAAGTT ATGCCAAAGT ACTGTTGGTT CGATTAAAAA AAACAGATCG TATTTATGCA  1020
ATGAAAGTTG TGAAAAAAGA GCTTGTTAAT GATGATGAGG ATATTGATTG GGTACAGACA  1080
GAGAAGCATG TGTTTGAGCA GGCATCCAAT CATCCTTTCC TTGTTGGGCT GCATTCTTGC  1140
TTTCAGACAG AAAGCAGATT GTTCTTTGTT ATAGAGTATG TAAATGGAGG AGACCTAATG  1200
TTTCATATGC AGCGACAAAG AAAACTTCCT GAAGAACATG CCAGATTTTA CTCTGCAGAA  1260
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CCTGAAATTT TAAGAGGAGA AGATTATGGT TTCAGTGTTG ACTGGTGGGC TCTTGGAGTG  1500
CTCATGTTTG AGATGATGGC AGGAAGGTCT CCATTTGATA TTGTTGGGAG CTCCGATAAC  1560
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TTCCGAAATG TTGATTGGGA TATGATGGAG CAAAAACAGG TGGTACCTCC CTTTAAACCA  1800
AATATTTCTG GGGAATTTGG TTTGGACAAC TTTGATTCTC AGTTTACTAA TGAACCTGTC  1860
CAGCTCACTC CAGATGACGA TGACATTGTG AGGAAGATTG ATCAGTCTGA ATTTGAAGGT  1920
TTTGAGTATA TCAATCCTCT TTTGATGTCT GCAGAAGAAT GTGTCTGATC CTCATTTTTC  1980
AACCATGTAT TCTACTCATG TTGCCATTTA ATGCATGGAT AAACTTGCTG CAAGCCTGGA  2040
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ACTATATGAA TCAATTATTA CATCTGTTTT ACTATGAAAA AAAAATTAAT ACTACTAGCT  2160
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SEQ ID NO:20 OAA1 Protein sequence:
Protein Accession #: NP_002731

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WIDEEGDPCT VSSQLELEEA FRLYELNKDS ELLIHVFPCV PERPGMPCPG EDKSIYRRGA   120
RRWRKLYCAN GHTFQAKRFN RRAHCAICTD RIWGLGRQGY KCINCKLLVH KKCHKLVTIE   180
CGRHSLPQEP VMPMDQSSMH SDHAQTVIPY NPSSHESLDQ VGEEKEAMNT RESGKASSSL   240
GLQDFDLLRV IGRGSYAKVL LVRLKKTDRI YAMKVVKKEL VNDDEDIDWV QTEKHVFEQA   300
SNHPFLVGLH SCFQTESRLF FVIEYVNGGD LMFHMQRQRK LPEEHARFYS AEISLALNYL   360
HERGIIYRDL KLDNVLLDSE GHIKLTDYGM CKEGLRPGDT TSTFCGTPNY IAPEILRGED   420
YGFSVDWWAL GVLMFEMMAG RSPFDIVGSS DNPDQNTEDY LFQVILEKQI RIPRSLSVKA   480
ASVLKSFLNK DPKERLGCHP QTGFADIQGH PFFRNVDWDM MEQKQVVPPF KPNISGEFGL   540
DNFDSQFTNE PVQLTPDDDD IVRKIDQSEF EGFEYINPLL MSAEECV
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SEQ ID NO:21 OBH2 DNA SEQUENCE

Nucleic Acid Accession #: L05628
Coding sequence: 197-4792 (underlined sequences correspond to start and stop codons)

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CGCCCGCGCC ACCGGCATGG CGCTCCGGGG CTTCTGCAGC GCCGATGGCT CCGACCCGCT   240
CTGGGACTGG AATGTCACGT GGAATACCAG CAACCCCGAC TTCACCAAGT GCTTTCAGAA   300
CACGGTCCTC GTGTGGGTGC CTTGTTTTTA CCTCTGGGCC TGTTTCCCCT TCTACTTCCT   360
CTATCTCTCC CGACATGACC GAGGCTACAT TCAGATGACA CCTCTCAACA AAACCAAAAC   420
TGCCTTGGGA TTTTTGCTGT GGATCGTCTG CTGGGCAGAC CTCTTCTACT CTTTCTGGGA   480
AAGAAGTCGG GGCATATTCC TGGCCCCAGT GTTTCTGGTC AGCCCAACTC TCTTGGGCAT   540
CACCACGCTG CTTGCTACCT TTTTAATTCA GCTGGAGAGG AGGAAGGGAG TTCAGTCTTC   600
AGGGATCATG CTCACTTTCT GGCTGGTAGC CCTAGTGTGT GCCCTAGCCA TCCTGAGATC   660
CAAAATTATG ACAGCCTTAA AAGAGGATGC CCAGGTGGAC CTGTTTCGTG ACATCACTTT   720
CTACGTCTAC TTTTCCCTCT TACTCATTCA GCTCGTCTTG TCCTGTTTCT CAGATCGCTC   780
ACCCCTGTTC TCGGAAACCA TCCACGACCC TAATCCCTGC CCAGAGTCCA GCGCTTCCTT   840
CCTGTCGAGG ATCACCTTCT GGTGGATCAC AGGGTTGATT GTCCGGGGCT ACCGCCAGCC   900
CCTGGAGGGC AGTGACCTCT GGTCCTTAAA CAAGGAGGAC ACGTCGGAAC AAGTCGTGCC   960
TGTTTTGGTA AAGAACTGGA AGAAGGAATG CGCCAAGACT AGGAAGCAGC CGGTGAAGGT  1020
TGTGTACTCC TCCAAGGATC CTGCCCAGCC GAAAGAGAGT TCCAAGGTGG ATGCGAATGA  1080
GGAGGTGGAG GCTTTGATCG TCAAGTCCCC ACAGAAGGAG TGGAACCCCT CTCTGTTTAA  1140
GGTGTTATAC AAGACCTTTG GGCCCTACTT CCTCATGAGC TTCTTCTTCA AGGCCATCCA  1200
CGACCTGATG ATGTTTTCCG GGCCGCAGAT CTTAAAGTTG CTCATCAAGT TCGTGAATGA  1260
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CCTGCAGACC CTCGTGCTGC ACCAGTACTT CCACATCTGC TTCGTCAGTG GCATGAGGAT  1380
CAAGACCGCT GTCATTGGGG CTGTCTATCG GAAGGCCCTG GTGATCACCA ATTCAGCCAG  1440
AAAATCCTCC ACGGTCGGGG AGATTGTCAA CCTCATGTCT GTGGACGCTC AGAGGTTCAT  1500
GGACTTGGCC ACGTACATTA ACATGATCTG GTCAGCCCCC CTGCAAGTCA TCCTTGCTCT  1560
CTACCTCCTG TGGCTGAATC TGGGCCCTTC CGTCCTGGCT GGAGTGGCGG TGATGGTCCT  1620
CATGGTGCCC GTCAATGCTG TGATGGCGAT GAAGACCAAG ACGTATCAGG TGGCCCACAT  1680
GAAGAGCAAA GACAATCGGA TCAAGCTGAT GAACGAAATT CTCAATGGGA TCAAAGTGCT  1740
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GCTGAAGGTG CTGAAGAAGT CTGCCTACCT GTCAGCCGTG GGCACCTTCA CCTGGGTCTG  1860
CACGCCCTTT CTGGTGGCCT TGTGCACATT TGCCGTCTAC GTGACCATTG ACGAGAACAA  1920
CATCCTGGAT GCCCAGACAG CCTTCGTGTC TTTGGCCTTG TTCAACATCC TCCGGTTTCC  1980
CCTGAACATT CTCCCCATGG TCATCAGCAG CATCGTGCAG GCGAGTGTCT CCCTCAAACG  2040
CCTGAGGATC TTTCTCTCCC ATGAGGAGCT GGAACCTGAC AGCATCGAGC GACGGCCTGT  2100
CAAAGACGGC GGGGGCACGA ACAGCATCAC CGTGAGGAAT GCCACATTCA CCTGGGCCAG  2160
GAGCGACCCT CCCACACTGA ATGGCATCAC CTTCTCCATC CCCGAAGGTG CTTTGGTGGC  2220
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CGTGGTGGGC CAGGTGGGCT GCGGAAAGTC GTCCCTGCTC TCAGCCCTCT TGGCTGAGAT  2280
GGACAAAGTG GAGGGGCACG TGGCTATCAA GGGCTCCGTG GCCTATGTGC CACAGCAGGC  2340
CTGGATTCAG AATGATTCTC TCCGAGAAAA CATCCTTTTT GGATGTCAGC TGGAGGAACC  2400
ATATTACAGG TCCGTGATAC AGGCCTGTGC CCTCCTCCCA GACCTGGAAA TCCTGCCCAG  2460
TGGGGATCGG ACAGAGATTG GCGAGAAGGG CGTGAACCTG TCTGGGGGCC AGAAGCAGCG  2520
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GGGCTCCCTG TTCAACGTCA TTGGTGCCTG CATCGTTATC CTGCTGGCCA CGCCCATCGC  3540
CGCCATCATC ATCCCGCCCC TTGGCCTCAT CTACTTCTTC GTCCAGAGGT TCTACGTGGC  3600
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CAACGAGACC TTGCTGGGGG TCAGCGTCAT TCGAGCCTTC GAGGAGCAGG AGCGCTTCAT  3720
CCACCAGAGT GACCTGAAGG TGGACGAGAA CCAGAAGGCC TATTACCCCA GCATCGTGGC  3780
CAACAGGTGG CTGGCCGTGC GGCTGGAGTG TGTGGGCAAC TGCATCGTTC TGTTTGCTGC  3840
CCTGTTTGCG GTGATCTCCA GGCACAGCCT CAGTGCTGGC TTGGTGGGCC TCTCAGTGTC  3900
TTACTCATTG CAGGTCACCA CGTACTTGAA CTGGCTGGTT CGGATGTCAT CTGAAATGGA  3960
AACCAACATC GTGGCCGTGG AGAGGCTCAA GGAGTATTCA GAGACTGAGA AGGAGGCGCC  4020
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CCGGAACTAC TGCCTGCGCT ACCGAGAGGA CCTGGACTTC GTTCTCAGGC ACATCAATGT  4140
CACGATCAAT GGGGGAGAAA AGGTCGGCAT CGTGGGGCGG ACGGGAGCTG GGAAGTCGTC  4200
CCTGACCCTG GGCTTATTTC GGATCAACGA GTCTGCCGAA GGAGAGATCA TCATCGATGG  4260
CATCAACATC GCCAAGATCG GCCTGCACGA CCTCCGCTTC AAGATCACCA TCATCCCCCA  4320
GGACCCTGTT TTGTTTTCGG GTTCCCTCCG AATGAACCTG GACCCATTCA GCCAGTACTC  4380
GGATGAAGAA GTCTGGACGT CCCTGGAGCT GGCCCACCTG AAGGACTTCG TGTCAGCCCT  4440
TCCTGACAAG CTAGACCATG AATGTGCAGA AGGCGGGGAG AACCTCAGTG TCGGGCAGCG  4500
CCAGCTTGTG TGCCTAGCCC GGGCCCTGCT GAGGAAGACG AAGATCCTTG TGTTGGATGA  4560
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GTTCGAGGAC TGCACCGTCC TCACCATCGC CCACCGGCTC AACACCATCA TGGACTACAC  4680
AAGGGTGATC GTCTTGGACA AAGGAGAAAT CCAGGAGTAC GGCGCCCCAT CGGACCTCCT  4740
GCAGCAGAGA GGTCTTTTCT ACAGCATGGC CAAAGACGCC GGCTTGGTGT GAGCCCCAGA  4800
GCTGGCATAT CTGGTCAGAA CTGCAGGGCC TATATGCCAG CGCCCAGGGA GGAGTCAGTA  4860
CCCCTGGTAA ACCAAGCCTC CCACACTGAA ACCAAAACAT AAAAACCAAA CCCAGACAAC  4920
CAAAACATAT TCAAAGCAGC AGCCACCGCC ATCCGGTCCC CTGCCTGGAA CTGGCTGTGA  4980
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SEQ ID NO:22 OBH2 Protein sequence:
Protein Accession #: AAB46616

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DRGYIQMTPL NKTKTALGFL LWIVCWADLF YSFWERSRGI FLAPVFLVSP TLLGITTLLA   120
TFLIQLERRK GVQSSGIMLT FWLVALVCAL AILRSKIMTA LKEDAQVDLF RDITFYVYFS   180
LLLIQLVLSC FSDRSPLFSE TIHDPNPCPE SSASFLSRIT FWWITGLIVR GYRQPLEGSD   240
LWSLNKEDTS EQVVPVLVKN WKKECAKTRK QPVKVVYSSK DPAQPKESSK VDANEEVEAL   300
IVKSPQKEWN PSLFKVLYKT FGPYFLMSFF FKAIHDLMMF SGPQILKLLI KFVNDTKAPD   360
WQGYFYTVLL FVTACLQTLV LHQYFHICFV SGMRIKTAVI GAVYRKALVI TNSARKSSTV   420
GEIVNLMSVD AQRFMDLATY INMIWSAPLQ VILALYLLWL NLGPSVLAGV AVMVLMVPVN   480
AVMAMKTKTY QVAHMKSKDN RIKLMNEILN GIKVLKLYAW ELAFKDKVLA IRQEELKVLK   540
KSAYLSAVGT FTWVCTPFLV ALCTFAVYVT IDENNILDAQ TAFVSLALFN ILRFPLNILP   600
MVISSIVQAS VSLKRLRIFL SHEELEPDSI ERRPVKDGGG TNSITVRNAT FTWARSDPPT   660
LNGITFSIPE GALVAVVGQV GCGKSSLLSA LLAEMDKVEG HVAIKGSVAY VPQQAWIQND   720
SLRENILFGC QLEEPYYRSV IQACALLPDL EILPSGDRTE IGEKGVNLSG GQKQRVSLAR   780
AVYSNADIYL FDDPLSAVDA HVGKHIFENV IGPKGMLKNK TRILVTHSMS YLPQVDVIIV   840
MSGGKISEMG SYQELLARDG AFAEFLRTYA STEQEQDAEE NGVTGVSGPG KEAKQMENGM   900
LVTDSAGKQL QRQLSSSSSY SGDISRHHNS TAELQKAEAK KEETWKLMEA DKAQTGQVKL   960
SVYWDYMKAI GLFISFLSIF LFMCNHVSAL ASNYWLSLWT DDPIVNGTQE HTKVRLSVYG  1020
ALGISQGIAV FGYSMAVSIG GILASRCLHV DLLHSILRSP MSFFERTPSG NLVNRFSKEL  1080
DTVDSMIPEV IKMFMGSLFN VIGACIVILL ATPIAAIIIP PLGLIYFFVQ RFYVASSRQL  1140
KRLESVSRSP VYSHFNETLL GVSVIRAFEE QERFIHQSDL KVDENQKAYY PSIVANRWLA  1200
VRLECVGNCI VLFAALFAVI SRHSLSAGLV GLSVSYSLQV TTYLNWLVRM SSEMETNIVA  1260
VERLKEYSET EKEAPWQIQE TAPPSSWPQV GRVEFRNYCL RYREDLDFVL RHINVTINGG  1320
EKVGIVGRTG AGKSSLTLGL FRINESAEGE IIIDGINIAK IGLHDLRFKI TIIPQDPVLF  1380
SGSLRMNLDP FSQYSDEEVW TSLELAHLKD FVSALPDKLD HECAEGGENL SVGQRQLVCL  1440
ARALLRKTKI LVLDEATAAV DLETDDLIQS TIRTQFEDCT VLTIAHRLNT IMDYTRVIVL  1500
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SEQ ID NO:23 PAA2 DNA SEQUENCE

Nucleic Acid Accession #: NM_013309
Coding sequence: 1-1290 (underlined sequences correspond to start and stop codons)

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TCTCGGTTCA ACAAACTTCG AGTTGTGGTG GCCGATGACG GTTCCGAAGC CCCGGAAAGG   180
CCTGTTAACG GGGCGCACCC GACCCTCCAG GCCGACGATG ATTCCTTACT GGACCAAGAC   240
TTACCTTTGA CCAACAGTCA GCTGAGTTTG AAGGTGGACT CCTGTGACAA CTGCAGCAAA   300
CAGAGAGAGA TACTGAAGCA GAGAAAGGTG AAAGCCAGGT TGACCATTGC TGCCGTTCTG   360
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GTTTTGTCAG CTATGATTAG TGTGCTGTTG GTGTATATAC TTATGGGATT CCTCTTATAT   600
GAAGCTGTGC AAAGAACTAT CCATATGAAC TATGAAATAA ATGGAGATAT AATGCTCATC   660
ACCGCAGCTG TTGGAGTTGC AGTTAATGTA ATAATGGGGT TTCTGTTGAA CCAGTCTGGT   720
CACCGTCACT CCCATTCCCA CTCCCTGCCT TCAAATTCCC CTACCAGAGG TTCTGGGTGT   780
GAACGTAACC ATGGGCAGGA TAGCCTGGCA GTGAGAGCTG CATTTGTACA TGCTTTGGGA   840
GATTTGGTAC AGAGTGTTGG TGTGCTAATA GCTGCATACA TCATACGATT CAAGCCAGAA   900
TACAAGATTG CTGATCCCAT CTGTACATAC GTATTTTCAT TACTTGTGGC TTTTACAACA   960
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GTAGACTATA TCAAAGAAGC CTTGATGAAA ATAGAAGATG TATATTCAGT CGAAGATTTA  1080
AATATCTGGT CTCTCACTTC AGGAAAATCT ACTGCCATAG TTCACATACA GCTAATTCCT  1140
GGAAGTTCAT CTAAATGGGA GGAAGTACAG TCCAAAGCAA ACCATTTATT ATTGAACACA  1200
TTTGGCATGT ATAGATGTAC TATTCAGCTT CAGAGTTACA GGCAAGAAGT GGACAGAACT  1260
TGTGCAAATT GTCAGAGTTC TAGTCCCTGA
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SEQ ID NO:24 <u>PAA2 Protein sequence:</u>
Protein Accession #: NP_037441

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FVNGAHPTLQ ADDDSLLDQD LPLTNSQLSL KVDSCDNCSK QREILKQRKV KARLTIAAVL   120
YLLFMIGELV GGYIANSLAI MTDALHMLTD LSAIILTLLA LWLSSKSPTK RFTFGFHRLE   180
VLSAMISVLL VYILMGFLLY EAVQRTIHMN YEINGDIMLI TAAVGVAVNV IMGFLLNQSG   240
HRHSHSHSLP SNSPTRGSGC ERNHGQDSLA VRAAFVHALG DLVQSVGVLI AAYIIRFKPE   300
YKIADPICTY VFSLLVAFTT FRIIWDTVVI ILEGVPSHLN VDYIKEALMK IEDVYSVEDL   360
NIWSLTSGKS TAIVHIQLIP GSSSKWEEVQ SKANHLLLNT FGMYRCTIQL QSYRQEVDRT   420
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SEQ ID NO:25 PAA3 DNA SEQUENCE

Nucleic Acid Accession #: AB037765
Coding sequence: 375-2798 (underlined sequences correspond to start and stop codons)

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AGGTCCCGGG CAGATAACAT AGATCATCAG TAGAAAACTT CTTGAAGTTG TTCAAGAAAA   240
ATTTGAAAGT AGCAAAATAG AAAATAAAGA ATTAACAGCA GATACAGAGG ACAGCATGGA   300
AGTGTTGTCT TAGGAAACAG AACACAGCAG TGAAAAAACA GACAAAATCC GCTCAGATAC   360
AACTGCAGCT GATAATGTTT TCCGGCTTCA ATGTCTTTAG AGTTGGGATC TCTTTTGTCA   420
TAATGTGCAT TTTTTACATG CCAACAGTAA ACTCTTTACC AGAACTGAGT CCTCAGAAAT   480
ATTTTAGTAC ATTGCAACCA GGTCTTGAAG AACTGAATGA GGCTGTTAGA CCTCTGCAGG   540
ACTATGGAAT TTCAGTTGCC AAGGTTAATT GTGTCAAAGA AGAAATATCA AGATACTGTG   600
GAAAAGAAAA GGATTTGATG AAAGCATATT TATTCAAGGG CAACATATTG CTCAGAGAAT   660
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TGAAAGGAAA AGCAAATATT ATATTCTCAT ATGTAAGAGC CATTGGAATA CCAGAGCACA   840
GAGCAGTCAT GGAAGCCGGT TTTGTGTATG GGACTACATA CCAATTTGTC TTAACCACAG   900
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AAGTTGCTGA AGATCCTCAA CAAGTTTCAA CTGTCCATCT CCAACTGGGC TTACCACTGG  1140
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ATGAAGTGGC AGAAACTGTT TTCAGAGATA GGAAGAGAAA ATTACCTTTG GAACTTACAG  1500
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TGGAACTAAC AGAAGAAACA TTTAATGCAA CAGTGATGGC TTCTGACAGC ATAGTACTCT  1560
TCTATGCTGG TTGGCAAGCA GTATCCATGG CATTTTTGCA ATCCTATATT GATGTGGCAG  1620
TTAAACTGAA AGGCACATCT ACTATGCTTC TTACTAGAAT AAACTGTGCA GATTGGTCTG  1680
ATGTATGTAC TAAGCAAAAT GTTACTGAAT TTCCTATCAT AAAGATGTAC AAGAAAGGCG  1740
AGAACCCAGT ATCTTATGCT GGAATGTTAG GAACCAAAGA TCTCCTAAAA TTTATCCAGC  1800
TCAACAGGAT TTCATATCCA GTGAATATAA CATCGATCCA AGAAGCAGAA GAATATTTAA  1860
GTGGGGAATT ATATAAAGAC CTCATCTTGT ATTCTAGTGT GTCAGTATTG GGACTATTTA  1920
GTCCAACCAT GAAAACAGCA AAAGAAGATT TTAGTGAAGC AGGAAACTAC CTAAAAGGAT  1980
ATGTTATCAC TGGAATTTAT TCTGAAGAAG ATGTTTTGCT ACTGTCAACC AAATATGCTG  2040
CAAGTCTTCC AGCCCTGCTG CTTGCCAGAC ACACAGAAGG CAAAATAGAG AGCATCCCAC  2100
TAGCTAGCAC ACATGCACAA GACATAGTTC AAATAATAAC AGATGCACTA CTGGAAATGT  2160
TTCCGGAAAT CACTGTGGAA AATCTTCCCA GTTATTTCAG ACTTCAGAAA CCATTATTGA  2220
TTTTGTTCAG TGATGGCACT GTAAATCCTC AATATAAAAA AGCAATATTG ACACTGGTAA  2280
AGCAGAAATA CTTGGATTCA TTTACTCCAT GCTGGTTAAA TCTAAAGAAT ACTCCAGTGG  2340
GGAGAGGAAT CTTGCGGGCA TATTTTGATC CTCTGCCTCC CCTTCCTCTT CTTGTTTTGG  2400
TGAATCTGCA TTCAGGTGGC CAAGTATTTG CATTTCCTTC AGACCAGGCT ATAATTGAAG  2460
AAAACCTTGT ATTGTGGCTG AAGAAATTAG AAGCAGGACT AGAAAATCAT ATCACAATTT  2520
TACCTGCTCA AGAATGGAAA CCTCCTCTTC CAGCTTATGA TTTTCTAAGT ATGATAGATG  2580
CCGCAACATC TCAACGTGGC ACTAGGAAAG TTCCCAAGTG TATGAAAGAA ACAGATGTGC  2640
AGGAGAATGA TAAGGAACAA CATGAAGATA AATCGGCAGT CAGAAAAGAA CCGATTGAAA  2700
CTCTGAGAAT AAAGCATTGG AATAGAAGTA ATTGGTTTAA AGAAGCAGAA AAATCATTTA  2760
GACGTGATAA AGAGTTAGGA TGCTCAAAAG TGAACTAATT TTATAGGGCT GTGGTTTCCA  2820
AAATTTTTTT GGCATGATAG ACTTAATTTA TTTCCTTAAA GAATAATATT AAATCATTTC  2880
AAGTTTGCAG ACTAGTGCCA TCCAATAGAA TTATAATATA AGTCACATAT TTTATTTAAA  2940
ATTTTCTAGT AACTACATTA AACAAAGTAA AAGTGAGCAG GGCAAAATAA TTTTGATATT  3000
ACTTTTCACC CAGTAGTATA CCCAAAATAG CGAAATATAG AAATTATTAA TGAGATATTT  3060
TACATCCTTT TTTGTACCAA GTCTTCTAAA TGCAGTACAT ATTTTATACT TACTGCATTT  3120
CTTACTTCCG AGTAGCCATA TTTCAAGTGT TCATTGCCAC ATGTGGCCTG TGACTACTGT  3180
ATTGGACAGT TCAGTACTAG ACAAAAACTA GCATAATTAA CTTAGTTCTA GCCATGATTT  3240
CTATTTGGAT TAAAATTAAA CTCTAATCAC AGTTAACTCC ACAGTGCATT CATGCAGCTG  3300
ACAGTTATAT TTGTTTTATT GGAGTCATGA TATTAAAATC AGCGTTTGTC AACCTCAGGG  3360
GATATTTAGC AATTGTCGGG AGACATTTTT GATGTCATGA CTAGGGCAGT TATTGACATT  3420
TAGTGAGTAG AGGCCATGGA TCCTGCTAAA TAACCTGCAT TGGACAGCGC CCCACAACAA  3480
AGAATTATCC TGCCCGAAAT GGTAGTCGTG CCAAGGCTGA GTAACCTTGT GTTAAAAGTA  3540
ACCTGTGGCA GACTAGGTTT CCAGAATTTC CTGGTTCTGC TCACGTATCA TGTTTGAAAA  3600
AATTTTGGCT ATTAAAGATA TGTATTAGAT GGTCTTATCC TGATTATTAC CTGGATACAA  3660
CTTGATCTTT TCTAATATTT TCAGAAAGTG ATGGGATAAC CCTAGAAGAG GACTCAGAAT  3720
GATATTTATA TTTTAAGTGA GTCTTAAAAC CTCCTCTTAT TTCTACAAGT TATATGGCTA  3780
AATTTCAGAT TGAACAGGGA TTCAGCATTC TGCCATCTCC TCATGGAAAG AGAGGCTCCC  3840
TCATCTGAAG CGTCTCTGAA ATCTACCCTT GCAAGCTTCA GACAAATCAG TTGATCTCCC  3900
TGAGCCACAC GGCCTCATTC TGTGAGGGAG GGAAAGATTA GCCAAAGAGT TAATTTTCAT  3960
TCCAAATCAC TTAGCTGTTA GACTGATCTG TTTGTAGCAG TTGTTTGTCT CATTTTTGCT  4020
CTGTGCATTT TTTGAGACAT TTGTTGAGAA TATTCTATTT GGTGCTCTAC TGTATTTTTC  4080
TTTTTAATAT CTACTTGATA TCTTGTTCTT TAAATTTTCT TCACATATGG TTTGCCTGAT  4140
ACAACTGATT TTTATAACTG AAATTTAAGG AATCTAACAG CTAAAACTCA GTAAGTGCAT  4200
MTATTTCCTT ATAACATAGA CCCGTTGCTA CTCTCAGCAC CCTCTCCTCA ATTTTTTTTC  4260
CTGTAGCATG TGATGCCTGA TTAAACTCAT TTTCATTTGC TTTTATTTCT AATATGGGAA  4320
CAATGAGAGT GAACTCTAAA TATAGGTTGT AGTAATAAAA CATCATTAGC CTAATTATTA  4380
GAAAATGCTA ATTAAGTACC AGCACATAGA AACATGAAAT TGCTTAGTCA TTGTACCTTT  4440
GTCAGCAATT TTGACAGTCA TTAATGTTTG TCATAATTTT AAATAAAGTG TCTGGGTTTC  4500
AGAATACCTT CAAAAAAAAA AAAAAA
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SEQ ID NO:26 PAA3 Protein sequence:
Protein Accession #: BAA92582

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1          11         21         31         41         51
|          |          |          |          |          |
MPSGFNVFRV GISPVIMCIF YMPTVNSLPE LSPQKYFSTL QPGLEELNEA VRPLQDYGIS    60
VAKVNCVKEE ISRYCGKEKD LMKAYLFKGN ILLREFPTDT LFDVNAIVAH VLFALLFSEV   120
KYITNLEDLQ NIENALKGKA NIIFSYVRAI GIPEHRAVME AGFVYGTTYQ FVLTTEIALL   180
ESIGSEDVEY AHLYFFHCKL VLDLTQQCRR TLMEQPLTTL NIHLFIKTMK APLLTEVAED   240
PQQVSTVHLQ LGLPLVFIVS QQATYEADRR TAEWVAWRLL GKAGVLLLLR DSLEVNIPQD   300
ANVVFKRAEE GVPVEFLVLH DVDLIISHVE NNMHIEEIQE DEDNDMEGPD IDVQDDEVAE   360
TVFRDRKRKL PLELTVELTE ETFNATVMAS DSIVLFYAGW QAVSMAFLQS YIDVAVKLKG   420
TSTMLLTRIN CADWSDVCTK QNVTEFPIIK MYKKGENPVS YAGMLGTKDL LKFIQLNRIS   480
YPVNITSIQE AEEYLSGELY KDLILYSSVS VLGLFSPTMK TAKEDFSEAG NYLKGYVITG   540
IYSEEDVLLL STKYAASLPA LLLARHTEGK IESIPLASTH AQDIVQIITD ALLEMFPEIT   600
VENLPSYFRL QKPLLILFSD GTVNPQYKKA ILTLVKQKYL DSFTPCWLNL KNTPVGRGIL   660
RAYFDPLPPL PLLVLVNLHS GGQVFAFPSD QAIIEENLVL WLKKLEAGLE NHITILPAQE   720
WKPPLPAYDF LSMIDAATSQ RGTRKVPKCM KETDVQENDK EQHEDKSAVR KEPIETLRIK   780
HWNRSNWFKE AEKSFRRDKE LGCSKVN
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SEQ ID NO:27 PAA5 DNA SEQUENCE

Nucleic Acid Accession #: NM_012449
Coding sequence: 66-1085 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
CCGAGACTCA CGGTCAAGCT AAGGCGAAGA GTGGGTGGCT GAAGCCATAC TATTTTATAG    60
AATTAATGGA AAGCAGAAAA GACATCACAA ACCAAGAAGA ACTTTGGAAA ATGAAGCCTA   120
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GGAGAAATTT AGAAGAAGAC GATTATTTGC ATAAGGACAC GGGAGAGACC AGCATGCTAA   180
AAAGACCTGT GCTTTTGCAT TTGCACCAAA CAGCCCATGC TGATGAATTT GACTGCCCTT   240
CAGAACTTCA GCACACACAG GAACTCTTTC CACAGTGGCA CTTGCCAATT AAAATAGCTG   300
CTATTATAGC ATCTCTGACT TTTCTTTACA CTCTTCTGAG GGAAGTAATT CACCCTTTAG   360
CAACTTCCCA TCAACAATAT TTTTATAAAA TTCCAATCCT GGTCATCAAC AAAGTCTTGC   420
CAATGGTTTC CATCACTCTC TTGGCATTGG TTTACCTGCC AGGTGTGATA GCAGCAATTG   480
TCCAACTTCA TAATGGAACC AAGTATAAGA AGTTTCCACA TTGGTTGGAT AAGTGGATGT   540
TAACAAGAAA GCAGTTTGGG CTTCTCAGTT TCTTTTTTGC TGTACTGCAT GCAATTTATA   600
GTCTGTCTTA CCCAATGAGG CGATCCTACA GATACAAGTT GCTAAACTGG GCATATCAAC   660
AGGTCCAACA AAATAAAGAA GATGCCTGGA TTGAGCATGA TGTTTGGAGA ATGGAGATTT   720
ATGTGTCTCT GGGAATTGTG GGATTGGCAA TACTGGCTCT GTTGGCTGTG ACATCTATTC   780
CATCTGTGAG TGACTCTTTG ACATGGAGAG AATTTCACTA TATTCAGAGC AAGCTAGGAA   840
TTGTTTCCCT TCTACTGGGC ACAATACACG CATTGATTTT TGCCTGGAAT AAGTGGATAG   900
ATATAAAACA ATTTGTATGG TATACACCTC CAACTTTTAT GATAGCTGTT TTCCTTCCAA   960
TTGTTGTCCT GATATTTAAA AGCATACTAT TCCTGCCATG CTTGAGGAAG AAGATACTGA  1020
AGATTAGACA TGGTTGGGAA GACGTCACCA AAATTAACAA AACTGAGATA TGTTCCCAGT  1080
TGTAGAATTA CTGTTTACAC ACATTTTTGT TCAATATTGA TATATTTTAT CACCAACATT  1140
TCAAGTTTGT ATTTGTTAAT AAAATGATTA TTCAAGGAAA AAAAAAAAAA AAAAA
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SEQ ID NO:28 PAA5 Protein sequence
Protein Accession #: NP_036581

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1          11         21         31         41         51
|          |          |          |          |          |
MESRKDITNQ EELWKMKPRR NLEEDDYLHK DTGETSMLKR PVLLHLHQTA HADEFDCPSE    60
LQHTQELFPQ WHLPIKIAAI IASLTFLYTL LREVIHPLAT SHQQYFYKIP ILVINKVLPM   120
VSITLLALVY LPGVIAAIVQ LHNGTKYKKF PHWLDKWMLT RKQFGLLSFF FAVLHAIYSL   180
SYPMRRSYRY KLLNWAYQQV QQNKEDAWIE HDVWRMEIYV SLGIVGLAIL ALLAVTSIPS   240
VSDSLTWREF HYIQSKLGIV SLLLGTIHAL IFAWNKWIDI KQFVWYTPPT FMIAVFLPIV   300
VLIFKSILFL PCLRKKILKI RHGWEDVTKI NKTEICSQL
```

SEQ ID NO:29 PAA7 DNA SEQUENCE

Nucleic Acid Accession #: NM_030774
Coding sequence: 1-963 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
ATGAGTTCCT GCAACTTCAC ACATGCCACC TTTGTGCTTA TTGGTATCCC AGGATTAGAG    60
AAAGCCCATT TCTGGGTTGG CTTCCCCCTC CTTTCCATGT ATGTAGTGGC AATGTTTGGA   120
AACTGCATCG TGGTCTTCAT CGTAAGGACG GAACGCAGCC TGCACGCTCC GATGTACCTC   180
TTTCTCTGCA TGCTTGCAGC CATTGACCTG GCCTTATCCA CATCCACCAT GCCTAAGATC   240
CTTGCCCTTT TCTGGTTTGA TTCCCGAGAG ATTAGCTTTG AGGCCTGTCT TACCCAGATG   300
TTCTTTATTC ATGCCCTCTC AGCCATTGAA TCCACCATCC TGCTGGCCAT GGCCTTTGAC   360
CGTTATGTGG CCATCTGCCA CCCACTGCGC CATGCTGCAG TGCTCAACAA TACAGTAACA   420
GCCCAGATTG GCATCGTGGC TGTGGTCCGC GGATCCCTCT TTTTTTTCCC ACTGCCTCTG   480
CTGATCAAGC GGCTGGCCTT CTGCCACTCC AATGTCCTCT CGCACTCCTA TTGTGTCCAC   540
CAGGATGTAA TGAAGTTGGC CTATGCAGAC ACTTTGCCCA ATGTGGTATA TGGTCTTACT   600
GCCATTCTGC TGGTCATGGG CGTGGACGTA ATGTTCATCT CCTTGTCCTA TTTTCTGATA   660
ATACGAACGG TTCTGCAACT GCCTTCCAAG TCAGAGCGGG CCAAGGCCTT TGGAACCTGT   720
GTGTCACACA TTGGTGTGGT ACTCGCCTTC TATGTGCCAC TTATTGGCCT CTCAGTGGTA   780
CACCGCTTTG GAAACAGCCT TCATCCCATT GTGCGTGTTG TCATGGGTGA CATCTACCTG   840
CTGCTGCCTC CTGTCATCAA TCCCATCATC TATGGTGCCA AAACCAAACA GATCAGAACA   900
CGGGTGCTGG CTATGTTCAA GATCAGCTGT GACAAGGACT TGCAGGCTGT GGGAGGCAAG   960
TGACCCTTAA CACTACACTT CTCCTTATCT TTATTGGCTT GATAAACATA ATTATTTCTA  1020
ACACTAGCTT ATTTCCAGTT GCCCATAAGC ACATCAGTAC TTTTCTCTGG CTGGAATAGT  1080
AAACTAAAGT ATGGTACATC TACCTAAAGG ACTATTATGT GGAATAATAC ATACTAATGA  1140
AGTATTACAT GATTTAAAGA CTACAATAAA ACCAAACATG CTTATAACAT TAAGAAAAAC  1200
AATAAAGATA CATGATTGAA ACCAAGTTGA AAAATAGCAT ATGCCTTGGA GGAAATGTGC  1260
TCAAATTACT AATGATTTAG TGTTGTCCCT ACTTTCTCTC TCTTTTTTCT TTCTTTTTTT  1320
TTTATTATGG TTAGCTGTCA CATACAACTT TTTTTTTTTT TGAGATGGGG TCTCGCTCTG  1380
TCACCAGGCT GGAGTGCAGT GGCGCGATCT CGGCTCACTG CAACCTCCAC ATCCCATGTT  1440
GAAGTAATTC TTCTGCCTCA GCCTCCCGAG TAGCTGGGAC TAGAGGAACG TGCCACCATG  1500
ACTGGCTAAT TTTCTGTATT TTTTAGTAGA GACAGAGTTT CACCATGTTG GCCAGGATGG  1560
TCTCGATCTC CTGACCTTGT GATCCACCCG CCTCAGCCTC CCAAAGTGTT GGGATTACAG  1620
GTGTGAACCA CTGTGCCCGG CCTGTGTACA ACTTTTTAAA TAGGGAATAT GATAGCTTCG  1680
CATGGTGGTG TGCACCTATA GCCCCCACTG CCTGGAAAGC TGAGGTGGGA GAATCGCTTG  1740
AGTCCAGGAG TTTGAGGTTA CAGTGATCCA CGATCGTACC ACTACACTCC AGCCTGGGCA  1800
ACAGAGCAAG ACCCTGTCTC AAAGCATAAA ATGGAATAAC ATATCAAATG AAACAGGGAA  1860
AATGAAGCTG ACAATTTATG GAAGCCAGGG CTTGTCACAG TCTCTACTGT TATTATGCAT  1920
TACCTGGGAA TTTATATAAG CCCTTAATAA TARTGCCAAT GAACATCTCA TGTGTGCTCA  1980
CAATGTTCTG GCACTATTAT AAGTGCTTCA CAGGTTTTAT GTGTTCTTCG TAACTTTATG  2040
GAGTAGGTAC CATTTGTGTC TCTTTATTAT AAGTGAGAGA AATGAAGTTT ATATTATCAA  2100
GGGGACTAAA GTCACACGGC TTGTGGGCAC TGTGCCAAGA TTTAAAATTA AATTTGATGG  2160
TTGAATACAG TTACTTAATG ACCATGTTAT ATTGCTTCCT GTGTAACATC TGCCATTTAT  2220
TTCCTCAGCT GTACAAATCC TCTGTTTTCT CTCTGTTACA CACTAACATC AATGGCTTTG  2280
TACTTGTGAT GAGAGATAAC CTTGCCCTAG TTGTGGGCAA CACATGCAGA ATAATCCTGT  2340
TTTACAGCTG CCTTTCGTGA TCTTATTGCT TGCTTTTTTC CAGATTCAGG GAGAATGTTG  2400
TTGTCTATTT GTCTCTTACA TCTCCTTGAT CATGTCTTCA TTTTTTAATG TGCTCTGTAC  2460
CTGTCAAAAA TTTTGAATGT ACACCACATG CTATTGTCTG AACTTGAGTA TAAGATAAAA  2520
TAAAATTTTA TTTTAAATTT T
```

SEQ ID NO:30 PAA7 PROTEIN SEQUENCE

Protein Accession #: NP_110401

```
1          11         21         31         41         51
|          |          |          |          |          |
MSSCNFTHAT FVLIGIPGLE KAHFWVGFPL LSMYVVAMFG NCIVVFIVRT ERSLHAPMYL    60
FLCMLAAIDL ALSTSTMPKI LALFWFDSRE ISFEACLTQM FFIHALSAIE STILLAMAFD   120
RYVAICHPLR HAAVLNNTVT AQIGIVAVVR GSLFFFPLPL LIKRLAFCHS NVLSHSYCVH   180
QDVMKLAYAD TLPNVVYGLT AILLVMGVDV MFISLSYFLI IRTVLQLPSK SERAKAFGTC   240
VSHIGVVLAF YVPLIGLSVV HRFGNSLHPI VRVVMGDIYL LLPPVINPII YGAKTKQIRT   300
RVLAMFKISC DKDLQAVGGK
```

SEQ ID NO:31 PAV6 DNA SEQUENCE

Nucleic Acid Accession #: XM_050837

Coding sequence: 1-1020 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
ATGAACTGGG AGCTGCTGCT GTGGCTGCTG GTGCTGTGCG CGCTGCTCCT GCTCTTGGTG    60
CAGCTGCTGC GCTTCCTGAG GGCTGACGGC GACCTGACGC TACTATGGGC CGAGTGGCAG   120
GGACGACGCC CAGAATGGGA GCTGACTGAT ATGGTGGTGT GGGTGACTGG AGCCTCGAGT   180
GGAATTGGTG AGGAGCTGGC TTACCAGTTG TCTAAACTAG GAGTTTCTCT TGTGCTGTCA   240
GCCAGAAGAG TGCATGAGCT GGAAAGGGTG AAAAGAAGAT GCCTAGAGAA TGGCAATTTA   300
AAAGAAAAAG ATATACTTGT TTTGCCCCTT GACCTGACCG ACACTGGTTC CCATGAAGCG   360
GCTACCAAAG CTGTTCTCCA GGAGTTTGGT AGAATCGACA TTCTGGTCAA CAATGGTGGA   420
ATGTCCCAGC GTTCTCTGTG CATGGATACC AGCTTGGATG TCTACAGAAA GCTAATAGAG   480
CTTAACTACT TAGGGACGGT GTCCTTGACA AAATGTGTTC TGCCTCACAT GATCGAGAGG   540
AAGCAAGGAA AGATTGTTAC TGTGAATAGC ATCCTGGGTA TCATATCTGT ACCTCTTTCC   600
ATTGGATACT GTGCTAGCAA GCATGCTCTC CGGGGTTTTT TTAATGGCCT TCGAACAGAA   660
CTTGCCACAT ACCCAGGTAT AATAGTTTCT AACATTTGCC CAGGACCTGT GCAATCAAAT   720
ATTGTGGAGA ATTCCCTAGC TGGAGAAGTC ACAAAGACTA TAGGCAATAA TGGAGACCAG   780
TCCCACAAGA TGACAACCAG TCGTTGTGTG CGGCTGATGT TAATCAGCAT GGCCAATGAT   840
TTGAAAGAAG TTTGGATCTC AGAACAACCT TTCTTGTTAG TAACATATTT GTGGCAATAC   900
ATGCCAACCT GGGCCTGGTG GATAACCAAC AAGATGGGGA AGAAAAGGAT TGAGAACTTT   960
AAGAGTGGTG TGGATGCAGA CTCTTCTTAT TTTAAAATCT TTAAGACAAA ACATGACTGA
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SEQ ID NO:32 PAV6 Protein sequence

Protein Accession #: XP_050837

```
1          11         21         31         41         51
|          |          |          |          |          |
MNWELLLWLL VLCALLLLLV QLLRFLRADG DLTLLWAEWQ GRRPEWELTD MVVWVTGASS    60
GIGEELAYQL. SKLGVSLVLS ARRVHELERV KRRCLENGNL KEKDILVLPL DLTDTGSHEA   120
ATKAVLQEFG RIDILVNNGG MSQRSLCMDT SLDVYRKLIE LNYLGTVSLT KCVLPHMIER   180
KQGKIVTVNS ILGIISVPLS IGYCASKHAL RGFFNGLRTE LATYPGIIVS NICPGPVQSN   240
IVENSLAGEV TKTIGNNGDQ SHKMTTSRCV RLMLISMAND LKEVWISEQP FLLVTYLWQY   300
MPTWAWWITN KMGKKRIENF KSGVDADSSY FKIFKTKHD
```

SEQ ID NO:33 PBA6 DNA SEQUENCE

Nucleic Acid Accession #: NM_006853

Coding sequence: 26-874 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
AGGAATCTGC GCTCGGGTTC CGCAGATGCA GAGGTTGAGG TGGCTGCGGG ACTGGAAGTC    60
ATCGGGCAGA GGTCTCACAG CAGCCAAGGA ACCTGGGGCC CGCTCCTCCC CCCTCCAGGC   120
CATGAGGATT CTGCAGTTAA TCCTGCTTGC TCTGGCAACA GGGCTTGTAG GGGGAGAGAC   180
CAGGATCATC AAGGGGTTCG AGTGCAAGCC TCACTCCCAG CCCTGGCAGG CAGCCCTGTT   240
CGAGAAGACG CGGCTACTCT GTGGGGCGAC GCTCATCGCC CCCAGATGGC TCCTGACAGC   300
AGCCCACTGC CTCAAGCCCC GCTACATAGT TCACCTGGGG CAGCACAACC TCCAGAAGGA   360
GGAGGGCTGT GAGCAGACCC GGACAGCCAC TGAGTCCTTC CCCCACCCCG GCTTCAACAA   420
CAGCCTCCCC AACAAAGACC ACCGCAATGA CATCATGCTG GTGAAGATGG CATCGCCAGT   480
CTCCATCACC TGGGCTGTGC GACCCCTCAC CCTCTCCTCA CGCTGTGTCA CTGCTGGCAC   540
CAGCTGCCTC ATTTCCGGCT GGGGCAGCAC GTCCAGCCCC CAGTTACGCC TGCCTCACAC   600
CTTGCGATGC GCCAACATCA CCATCATTGA GCACCAGAAG TGTGAGAACG CCTACCCCGG   660
CAACATCACA GACACCATGG TGTGTGCCAG CGTGCAGGAA GGGGGCAAGG ACTCCTGCCA   720
GGGTGACTCC GGGGGCCCTC TGGTCTGTAA CCAGTCTCTT CAAGGCATTA TCTCCTGGGG   780
CCAGGATCCG TGTGCGATCA CCCGAAAGCC TGGTGTCTAC ACGAAAGTCT GCAAATATGT   840
GGACTGGATC CAGGAGACGA TGAAGAACAA TTAGACTGGA CCCACCCACC ACAGCCCATC   900
ACCCTCCATT TCCACTTGGT GTTTGGTTCC TGTTCACTCT GTTAATAAGA AACCCTAAGC   960
CAAGACCCTC TACGAACATT CTTTGGGCCT CCTGGACTAC AGGAGATGCT GTCACTTAAT  1020
AATCAACCTG GGGTTCGAAA TCAGTGAGAC CTGGATTCAA ATTCTGCCTT GAAATATTGT  1080
GACTCTGGGA ATGACAACAC CTGGTTTGTT CTCTGTTGTA TCCCCAGCCC CAAAGACAGC  1140
TCCTGGCCAT ATATCAAGGT TTCAATAAAT ATTTGCTAAA TGAGTG
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SEQ ID NO:34 PBA6 PROTEIN SEQUENCE

Protein Accession #: NP_006844

```
1          11         21         31         41         51
|          |          |          |          |          |
MRILQLILLA LATGLVGGET RIIKGFECKP HSQPWQAALF EKTRLLCGAT LIAPRWLLTA    60
AHCLKPRYIV HLGQHNLQKE EGCEQTRTAT ESFPHPGFNN SLPNKDHRND IMLVKMASPV   120
SITWAVRPLT LSSRCVTAGT SCLISGWGST SSPQLRLPHT LRCANITIIE HQKCENAYPG   180
NITDTMVCAS VQEGGKDSCQ GDSGGPLVCN QSLQGIISWG QDPCAITRKP GVYTKVCKYV   240
DWIQETMKNN
```

SEQ ID NO:35 PBC1 DNA SEQUENCE

Nucleic Acid Accession #: NM_001775
Coding sequence: 70-972 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
CTAAAGCTCT CTTGCTGCCT AGCCTCCTGC CGGCCTCATC TTCGCCCAGC CAACCCCGCC    60
TGGAGCCCTA TGGCCAACTG CGAGTTCAGC CCGGTGTCCG GGGACAAACC CTGCTGCCGG   120
CTCTCTAGGA GAGCCCAACT CTGTCTTGGC GTCAGTATCC TGGTCCTGAT CCTCGTCGTG   180
GTGCTCGCGG TGGTCGTCCC GAGGTGGCGC CAGACGTGGA GCGGTCCGGG CACCACCAAG   240
CGCTTTCCCG AGACCGTCCT GGCGCGATGC GTCAAGTACA CTGAAATTCA TCCTGAGATG   300
AGACATGTAG ACTGCCAAAG TGTATGGGAT GCTTTCAAGG GTGCATTTAT TTCAAAACAT   360
CCTTGCAACA TTACTGAAGA AGACTATCAG CCACTAATGA AGTTGGGAAC TCAGACCGTA   420
CCTTGCAACA AGATTCTTCT TTGGAGCAGA ATAAAAGATC TGGCCCATCA GTTCACACAG   480
GTCCAGCGGG ACATGTTCAC CCTGGAGGAC ACGCTGCTAG GCTACCTTGC TGATGACCTC   540
ACATGGTGTG GTGAATTCAA CACTTCCAAA ATAAACTATC AATCTTGCCC AGACTGGAGA   600
AAGGACTGCA GCAACAACCC TGTTTCAGTA TTCTGGAAAA CGGTTTCCCG CAGGTTTGCA   660
GAAGCTGCCT GTGATGTGGT CCATGTGATG CTCAATGGAT CCCGCAGTAA AATCTTTGAC   720
AAAAACAGCA CTTTTGGGAG TGTGGAAGTC CATAATTTGC AACCAGAGAA GGTTCAGACA   780
CTAGAGGCCT GGGTGATACA TGGTGGAAGA GAAGATTCCA GAGACTTATG CCAGGATCCC   840
ACCATAAAAG AGCTGGAATC GATTATAAGC AAAAGGAATA TTCAATTTTC CTGCAAGAAT   900
ATCTACAGAC CTGACAAGTT TCTTCAGTGT GTGAAAAATC CTGAGGATTC ATCTTGCACA   960
TCTGAGATCT GAGCCAGTCG CTGTGGTTGT TTTAGCTCCT TGACTCCTTG TGGTTTATGT  1020
CATCATACAT GACTCAGCAT ACCTGCTGGT GCAGAGCTGA AGATTTTGGA GGGTCCTCCA  1080
CAATAAGGTC AATGCCAGAG ACGGAAGCCT TTTTCCCCAA AGTCTTAAAA TAACTTATAT  1140
CATCAGCATA CCTTTATTGT GATCTATCAA TAGTCAAGAA AAATTATTGT ATAAGATTAG  1200
AATGAAAATT GTATGTTAAG TTACTTCCTT TAG
```

SEQ ID NO:36 PBC1 Protein sequence
Protein Accession #: NP_001766

```
1          11         21         31         41         51
|          |          |          |          |          |
MANCEFSPVS GDKPCCRLSR RAQLCLGVSI LVLILVVVLA VVVPRWRQTW SGPGTTKRFP    60
ETVLARCVKY TEIHPEMRHV DCQSVWDAFK GAFISKHPCN ITEEDYQPLM KLGTQTVPCN   120
KILLWSRIKD LAHQFTQVQR DMFTLEDTLL GYLADDLTWC GEFNTSKINY QSCPDWRKDC   180
SNNPVSVFWK TVSRRFAEAA CDVVHVMLNG SRSKIFDKNS TFGSVEVHNL QPEKVQTLEA   240
WVIHGGREDS RDLCQDPTIK ELESIISKRN IQFSCKNIYR PDKFLQCVKN PEDSSCTSEI
```

SEQ ID NO:37 PBH1 DNA SEQUENCE

Nucleic Acid Accession #: XM_017718
Coding sequence: 1-3315 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
|          |          |          |          |          |
ATGTCCTTTC GGGCAGCCAG GCTCAGCATG AGGAACAGAA GGAATGACAC TCTGGACAGC    60
ACCCGGACCC TGTACTCCAG CGCGTCTCGG AGCACAGACT TGTCTTACAG TGAAAGCGAC   120
TTGGTGAATT TTATTCAAGC AAATTTTAAG AAACGAGAAT GTGTCTTCTT TACCAAAGAT   180
TCCAAGGCCA CGGAGAATGT GTGCAAGTGT GGCTATGCCC AGAGCCAGCA CATGGAAGGC   240
ACCCAGATCA ACCAAAGTGA GAAATGGAAC TACAAGAAAC ACACCAAGGA ATTTCCTACC   300
GACGCCTTTG GGGATATTCA GTTTGAGACA CTGGGGAAGA AAGGGAAGTA TATACGTCTG   360
TCCTGCGACA CGGACGCGGA AATCCTTTAC GAGCTGCTGA CCCAGCACTG GCACCTGAAA   420
ACACCCAACC TGGTCATTTC TGTGACCGGG GGCGCCAAGA ACTTCGCCCT GAAGCCGCGC   480
ATGCGCAAGA TCTTCAGCCG GCTCATCTAC ATCGCGCAGT CCAAAGGTGC TTGGATTCTC   540
ACGGGAGGCA CCCATTATGG CCTGATGAAG TACATCGGGG AGGTGGTGAG AGATAACACC   600
ATCAGCAGGA GTTCAGAGGA GAATATTGTG GCCATTGGCA TAGCAGCTTG GGGCATGGTC   660
TCCAACCGGG ACACCCTCAT CAGGAATTGC GATGCTGAGG GCTATTTTTT AGCCCAGTAC   720
CTTATGGATG ACTTCACAAG AGATCCACTG TATATCCTGG ACAACAACCA CACACATTTG   780
CTGCTCGTGG ACAATGGCTG TCATGGACAT CCCACTGTCG AAGCAAAGCT CCGGAATCAG   840
CTAGAGAAGT ATATCTCTGA GCGCACTATT CAAGATTCCA ACTATGGTGG CAAGATCCCC   900
ATTGTGTGTT TTGCCCAAGG AGGTGGAAAA GAGACTTTGA AAGCCATCAA TACCTCCATC   960
AAAAATAAAA TTCCTTGTGT GGTGGTGGAA GGCTCGGGCC AGATCGCTGA TGTGATCGCT  1020
AGCCTGGTGG AGGTGGAGGA TGCCCTGACA TCTTCTGCCG TCAAGGAGAA GCTGGTGCGC  1080
TTTTTACCCC GCACGGTGTC CCGGCTGCCT GAGGAGGAGA CTGAGAGTTG GATCAAATGG  1140
CTCAAAGAAA TTCTCGAATG TTCTCACCTA TTAACAGTTA TTAAAATGGA AGAAGCTGGG  1200
GATGAAATTG TGAGCAATGC CATCTCCTAC GCTCTATACA AAGCCTTCAG CACCAGTGAG  1260
CAAGACAAGG ATAACTGGAA TGGGCAGCTG AAGCTTCTGC TGGAGTGGAA CCAGCTGGAC  1320
TTAGCCAATG ATGAGATTTT CACCAATGAC CGCCGATGGG AGTCTGCTGA CCTTCAAGAA  1380
GTCATGTTTA CGGCTCTCAT AAAGGACAGA CCCAAGTTTG TCCGCCTCTT TCTGGAGAAT  1440
GGCTTGAACC TACGGAAGTT TCTCACCCAT GATGTCCTCA CTGAACTCTT CTCCAACCAC  1500
TTCAGCACGC TTGTGTACCG GAATCTGCAG ATCGCCAAGA ATTCCTATAA TGATGCCCTC  1560
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CTCACGTTTG TCTGGAAACT GGTTGCGAAC TTCCGAAGAG GCTTCCGGAA GGAAGACAGA  1620
AATGGCCGGG ACGAGATGGA CATAGAACTC CACGACGTGT CTCCTATTAC TCGGCACCCC  1680
CTGCAAGCTC TCTTCATCTG GGCCATTCTT CAGAATAAGA AGGAACTCTC CAAAGTCATT  1740
TGGGAGCAGA CCAGGGGCTG CACTCTGGCA GCCCTGGGAG CCAGCAAGCT TCTGAAGACT  1800
CTGGCCAAAG TGAAGAACGA CATCAATGCT GCTGGGGAGT CCGAGGAGCT GGCTAATGAG  1860
TACGAGACCC GGGCTGTTGA GCTGTTCACT GAGTGTTACA GCAGCGATGA AGACTTGGCA  1920
GAACAGCTGC TGGTCTATTC CTGTGAAGCT TGGGGTGGAA GCAACTGTCT GGAGCTGGCG  1980
GTGGAGGCCA CAGACCAGCA TTTCATCGCC CAGCCTGGGG TCCAGAATTT TCTTTCTAAG  2040
CAATGGTATG GAGAGATTTC CCGAGACACC AAGAACTGGA AGATTATCCT GTGTCTGTTT  2100
ATTATACCCT TGGTGGGCTG TGGCTTTGTA TCATTTAGGA AGAAACCTGT CGACAAGCAC  2160
AAGAAGCTGC TTTGGTACTA TGTGGCGTTC TTCACCTCCC CCTTCGTGGT CTTCTCCTGG  2220
AATGTGGTCT TCTACATCGC CTTCCTCCTG CTGTTTGCCT ACGTGCTGCT CATGGATTTC  2280
CATTCGGTGC CACACCCCCC CGAGCTGGTC CTGTACTCGC TGGTCTTTGT CCTCTTCTGT  2340
GATGAAGTGA GACAGTGGTA CGTAAATGGG GTGAATTATT TTACTGACCT GTGGAATGTG  2400
ATGGACACGC TGGGGCTTTT TTACTTCATA GCAGGAATTG TATTTCGGCT CCACTCTTCT  2460
AATAAAAGCT CTTTGTATTC TGGACGAGTC ATTTTCTGTC TGGACTACAT TATTTTCACT  2520
CTAAGATTGA TCCACATTTT TACTGTAAGC AGAAACTTAG GACCCAAGAT TATAATGCTG  2580
CAGAGGATGC TGATCGATGT GTTCTTCTTC CTGTTCCTCT TTGCGGTGTG GATGGTGGCC  2640
TTTGGCGTGG CCAGGCAAGG GATCCTTAGG CAGAATGAGC AGCGCTGGAG GTGGATATTC  2700
CGTTCGGTCA TCTACGAGCC CTACCTGGCC ATGTTCGGCC AGGTGCCCAG TGACGTGGAT  2760
GGTACCACGT ATGACTTTGC CCACTGCACC TTCACTGGGA ATGAGTCCAA GCCACTGTGT  2820
GTGGAGCTGG ATGAGCACAA CCTGCCCCGG TTCCCCGAGT GGATCACCAT CCCCCTGGTG  2880
TGCATCTACA TGTTATCCAC CAACATCCTG CTGGTCAACC TGCTGGTCGC CATGTTTGGC  2940
TACACGGTGG GCACCGTCCA GGAGAACAAT GACCAGGTCT GGAAGTTCCA GAGGTACTTC  3000
CTGGTGCAGG AGTACTGCAG CCGCCTCAAT ATCCCCTTCC CCTTCATCGT CTTCGCTTAC  3060
TTCTACATGG TGGTGAAGAA GTGCTTCAAG TGTTGCTGCA AGGAGAAAAA CATGGAGTCT  3120
TCTGTCTGCT GTTTCAAAAA TGAAGACAAT GAGACTCTGG CATGGGAGGG TGTCATGAAG  3180
GAAAACTACC TTGTCAAGAT CAACACAAAA GCCAACGACA CCTCAGAGGA AATGAGGCAT  3240
CGATTTAGAC AACTGGATAC AAAGCTTAAT GATCTCAAGG GTCTTCTGAA AGAGATTGCT  3300
AATAAAATCA AATGA
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SEQ ID NO:38 PBH1 Protein sequence
Protein Accession #: XP_017718

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1          11         21         31         41         51
|          |          |          |          |          |
MSFRAARLSM RNRRNDTLDS TRTLYSSASR STDLSYSESD LVNFIQANFK KRECVFFTKD    60
SKATENVCKC GYAQSQHMEG TQINQSEKWN YKKHTKEFPT DAFGDIQFET LGKKGKYIRL   120
SCDTDAEILY ELLTQHWHLK TPNLVISVTG GAKNFALKPR MRKIFSRLIY IAQSKGAWIL   180
TGGTHYGLMK YIGEVVRDNT ISRSSEENIV AIGIAAWGMV SNRDTLIRNC DAEGYFLAQY   240
LMDDFTRDPL YILDNNHTHL LLVDNGCHGH PTVEAKLRNQ LEKYISERTI QDSNYGGKIP   300
IVCFAQGGGK ETLKAINTSI KNKIPCVVVE GSGQIADVIA SLVEVEDALT SSAVKEKLVR   360
FLPRTVSRLP EEETESWIKW LKEILECSHL LTVIKMEEAG DEIVSNAISY ALYKAFSTSE   420
QDKDNWNGQL KLLLEWNQLD LANDEIFTND RRWESADLQE VMFTALIKDR PKFVRLFLEN   480
GLNLRKFLTH DVLTELFSNH FSTLVYRNLQ IAKNSYNDAL LTFVWKLVAN FRRGFRKEDR   540
NGRDEMDIEL HDVSPITRHP LQALFIWAIL QNKKELSKVI WEQTRGCTLA ALGASKLLKT   600
LAKVKNDINA AGESEELANE YETRAVELFT ECYSSDEDLA EQLLVYSCEA WGGSNCLELA   660
VEATDQHFIA QPGVQNFLSK QWYGEISRDT KNWKIILCLF IIPLVGCGFV SFRKKPVDKH   720
KKLLWYYVAF FTSPFVVFSW NVVFYIAFLL LFAYVLLMDF HSVPHPPELV LYSLVFVLFC   780
DEVRQWYVNG VNYFTDLWNV MDTLGLFYFI AGIVFRLHSS NKSSLYSGRV IFCLDYIIFT   840
LRLIHIFTVS RNLGPKIIML QRMLIDVFFF LFLFAVWMVA FGVARQGILR QNEQRWRWIF   900
RSVIYEPYLA MFGQVPSDVD GTTYDFAHCT FTGNESKPLC VELDEHNLPR FPEWITIPLV   960
CIYMLSTNIL LVNLLVAMFG YTVGTVQENN DQVWKFQRYF LVQEYCSRLN IPFPFIVFAY  1020
FYMVVKKCFK CCCKEKNMES SVCCFKNEDN ETLAWEGVMK ENYLVKINTK ANDTSEEMRH  1080
RFRQLDTKLN DLKGLLKEIA NKIK
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SEQ ID NO:39 PBH3 DNA SEQUENCE

Nucleic Acid Accession #: XM_011804
Coding sequence: 1-558 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
|          |          |          |          |          |
ATGCCTCGCC TGTTCTTGTT CCACCTGCTA GAATTCTGTT TACTACTGAA CCAATTTTCC    60
AGAGCAGTCG CGGCCAAATG GAAGGACGAT GTTATTAAAT TATGCGGCCG CGAATTAGTT   120
CGCGCGCAGA TTGCCATTTG CGGCATGAGC ACCTGGAGCA AAAGGTCTCT GAGCCAGGAA   180
GATGCTCCTC AGACACCTAG ACCAGTGGCA GAAATTGTAC CATCCTTCAT CAACAAAGAT   240
ACAGAAACTA TAATTATCAT GTTGGAATTC ATTGCTAATT TGCCACCGGA GCTGAAGGCA   300
GCCCTATCTG AGAGGCAACC ATCATTACCA GAGCTACAGC AGTATGTACC TGCATTAAAG   360
GATTCCAATC TTAGCTTTGA AGAATTTAAG AAACTTATTC GCAATAGGCA AAGTGAAGCC   420
GCAGACAGCA ATCCTTCAGA ATTAAAATAC TTAGGCTTGG ATACTCATTC TCAAAAAAAG   480
AGACGACCCT ACGTGGCACT GTTTGAGAAA TGTTGCCTAA TTGGTTGTAC CAAAAGGTCT   540
CTTGCTAAAT ATTGCTGA
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SEQ ID NO:40 PBH3 PROTEIN SEQUENCE

Protein Accession #: NP_008842

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1          11         21         31         41         51
|          |          |          |          |          |
MPRLFLFHLL EFCLLLNQFS RAVAAKWKDD VIKLCGRELV RAQIAICGMS TWSKRSLSQE    60
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DAPQTPRPVA EIVPSFINKD TETIIIMLEF IANLPPELKA ALSERQPSLP ELQQYVPALK   120
DSNLSFEEFK KLIRNRQSEA ADSNPSELKY LGLDTHSQKK RRPYVALFEK CCLIGCTKRS   180
LAKYC
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SEQ ID NO:41 PBH5 DNA SEQUENCE

Nucleic Acid Accession #: NM_005845

Coding sequence: 1-3978 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
|          |          |          |          |          |
ATGCTGCCCG TGTACCAGGA GGTGAAGCCC AACCCGCTGC AGGACGCGAA CCTCTGCTCA     60
CGCGTGTTCT TCTGGTGGCT CAATCCCTTG TTTAAAATTG GCCATAAACG GAGATTAGAG    120
GAAGATGATA TGTATTCAGT GCTGCCAGAA GACCGCTCAC AGCACCTTGG AGAGGAGTTG    180
CAAGGGTTCT GGGATAAAGA AGTTTTAAGA GCTGAGAATG ACGCACAGAA GCCTTCTTTA    240
ACAAGAGCAA TCATAAAGTG TTACTGGAAA TCTTATTTAG TTTTGGGAAT TTTTACGTTA    300
ATTGAGGAAA GTGCCAAAGT AATCCAGCCC ATATTTTTGG GAAAAATTAT TAATTATTTT    360
GAAAATTATG ATCCCATGGA TTCTGTGGCT TTGAACACAG CGTACGCCTA TGCCACGGTG    420
CTGACTTTTT GCACGCTCAT TTTGGCTATA CTGCATCACT TATATTTTTA TCACGTTCAG    480
TGTGCTGGGA TGAGGTTACG AGTAGCCATG TGCCATATGA TTTATCGGAA GGCACTTCGT    540
CTTAGTAACA TGGCCATGGG GAAGACAACC ACAGGCCAGA TAGTCAATCT GCTGTCCAAT    600
GATGTGAACA AGTTTGATCA GGTGACAGTG TTCTTACACT TCCTGTGGGC AGGACCACTG    660
CAGGCGATCG CAGTGACTGC CCTACTCTGG ATGGAGATAG GAATATCGTG CCTTGCTGGG    720
ATGGCAGTTC TAATCATTCT CCTGCCCTTG CAAAGCTGTT TTGGGAAGTT GTTCTCATCA    780
CTGAGGAGTA AAACTGCAAC TTTCACGGAT GCCAGGATCA GGACCATGAA TGAAGTTATA    840
ACTGGTATAA GGATAATAAA AATGTACGCC TGGGAAAAGT CATTTTCAAA TCTTATTACC    900
AATTTGAGAA AGAAGGAGAT TTCCAAGATT CTGAGAAGTT CCTGCCTCAG GGGGATGAAT    960
TTGGCTTCGT TTTTCAGTGC AAGCAAAATC ATCGTGTTTG TGACCTTCAC CACCTACGTG   1020
CTCCTCGGCA GTGTGATCAC AGCCAGCCGC GTGTTCGTGG CAGTGACGCT GTATGGGGCT   1080
GTGCGGCTGA CGGTTACCCT CTTCTTCCCC TCAGCCATTG AGAGGGTGTC AGAGGCAATC   1140
GTCAGCATCC GAAGAATCCA GACCTTTTTG CTACTTGATG AGATATCACA GCGCAACCGT   1200
CAGCTGCCGT CAGATGGTAA AAAGATGGTG CATGTGCAGG ATTTTACTGC TTTTTGGGAT   1260
AAGGCATCAG AGACCCCAAC TCTACAAGGC CTTTCCTTTA CTGTCAGACC TGGCGAATTG   1320
TTAGCTGTGG TCGGCCCCGT GGGAGCAGGG AAGTCATCAC TGTTAAGTGC CGTGCTCGGG   1380
GAATTGGCCC CAAGTCACGG GCTGGTCAGC GTGCATGGAA GAATTGCCTA TGTGTCTCAG   1440
CAGCCCTGGG TGTTCTCGGG AACTCTGAGG AGTAATATTT TATTTGGGAA GAAATACGAA   1500
AAGGAACGAT ATGAAAAAGT CATAAAGGCT TGTGCTCTGA AAAAGGATTT ACAGCTGTTG   1560
GAGGATGGTG ATCTGACTGT GATAGGAGAT CGGGGAACCA CGCTGAGTGG AGGGCAGAAA   1620
GCACGGGTAA ACCTTGCAAG AGCAGTGTAT CAAGATGCTG ACATCTATCT CCTGGACGAT   1680
CCTCTCAGTG CAGTAGATGC GGAAGTTAGC AGACACTTGT TCGAACTGTG TATTTGTCAA   1740
ATTTTGCATG AGAAGATCAC AATTTTAGTG ACTCATCAGT TGCAGTACCT CAAAGCTGCA   1800
AGTCAGATTC TGATATTGAA AGATGGTAAA ATGGTGCAGA AGGGGACTTA CACTGAGTTC   1860
CTAAAATCTG GTATAGATTT TGGCTCCCTT TTAAAGAAGG ATAATGAGGA AAGTGAACAA   1920
CCTCCAGTTC CAGGAACTCC CACACTAAGG AATCGTACCT TCTCAGAGTC TTCGGTTTGG   1980
TCTCAACAAT CTTCTAGACC CTCCTTGAAA GATGGTGCTC TGGAGAGCCA AGATACAGAG   2040
AATGTCCCAG TTACACTATC AGAGGAGAAC CGTTCTGAAG GAAAAGTTGG TTTTCAGGCC   2100
TATAAGAATT ACTTCAGAGC TGGTGCTCAC TGGATTGTCT TCATTTTCCT TATTCTCCTA   2160
AACACTGCAG CTCAGGTTGC CTATGTGCTT CAAGATTGGT GGCTTTCATA CTGGGCAAAC   2220
AAACAAAGTA TGCTAAATGT CACTGTAAAT GGAGGAGGAA ATGTAACCGA GAAGCTAGAT   2280
CTTAACTGGT ACTTAGGAAT TTATTCAGGT TTAACTGTAG CTACCGTTCT TTTTGGCATA   2340
GCAAGATCTC TATTGGTATT CTACGTCCTT GTTAACTCTT CACAAACTTT GCACAACAAA   2400
ATGTTTGAGT CAATTCTGAA AGCTCCGGTA TTATTCTTTG ATAGAAATCC AATAGGAAGA   2460
ATTTTAAATC GTTTCTCCAA AGACATTGGA CACTTGGATG ATTTGCTGCC GCTGACGTTT   2520
TTAGATTTCA TCCAGACATT GCTACAAGTG GTTGGTGTGG TCTCTGTGGC TGTGGCCGTG   2580
ATTCCTTGGA TCGCAATACC CTTGGTTCCC CTTGGAATCA TTTTCATTTT TCTTCGGCGA   2640
TATTTTTTGG AAACGTCAAG AGATGTGAAG CGCCTGGAAT CTACAACTCG GAGTCCAGTG   2700
TTTTCCCACT TGTCATCTTC TCTCCAGGGG CTCTGGACCA TCCGGGCATA CAAAGCAGAA   2760
GAGAGGTGTC AGGAACTGTT TGATGCACAC CAGGATTTAC ATTCAGAGGC TTGGTTCTTG   2820
TTTTTGACAA CGTCCCGCTG GTTCGCCGTC CGTCTGGATG CCATCTGTGC CATGTTTGTC   2880
ATCATCGTTG CCTTTGGGTC CCTGATTCTG GCAAAAACTC TGGATGCCGG GCAGGTTGGT   2940
TTGGCACTGT CCTATGCCCT CACGCTCATG GGGATGTTTC AGTGGTGTGT TCGACAAAGT   3000
GCTGAAGTTG AGAATATGAT GATCTCAGTA GAAAGGGTCA TTGAATACAC AGACCTTGAA   3060
AAAGAAGCAC CTTGGGAATA TCAGAAACGC CCACCACCAG CCTGGCCCCA TGAAGGAGTG   3120
ATAATCTTTG ACAATGTGAA CTTCATGTAC AGTCCAGGTG GGCCTCTGGT ACTGAAGCAT   3180
CTGACAGCAC TCATTAAATC ACAAGAAAAG GTTGGCATTG TGGGAAGAAC CGGAGCTGGA   3240
AAAAGTTCCC TCATCTCAGC CCTTTTTAGA TTGTCAGAAC CCGAAGGTAA AATTTGGATT   3300
GATAAGATCT TGACAACTGA AATTGGACTT CACGATTTAA GGAAGAAAAT GTCAATCATA   3360
CCTCAGGAAC CTGTTTTGTT CACTGGAACA ATGAGGAAAA ACCTGGATCC CTTTAATGAG   3420
CACACGGATG AGGAACTGTG GAATGCCTTA CAAGAGGTAC AACTTAAAGA AACCATTGAA   3480
GATCTTCCTG GTAAAATGGA TACTGAATTA GCAGAATCAG GATCCAATTT TAGTGTTGGA   3540
CAAAGACAAC TGGTGTGCCT TGCCAGGGCA ATTCTCAGGA AAAATCAGAT ATTGATTATT   3600
GATGAAGCGA CGGCAAATGT GGATCCAAGA ACTGATGAGT TAATACAAAA AAAAATCCGG   3660
GAGAAATTTG CCCACTGCAC CGTGCTAACC ATTGCACACA GATTGAACAC CATTATTGAC   3720
AGCGACAAGA TAATGGTTTT AGATTCAGGA AGACTGAAAG AATATGATGA GCCGTATGTT   3780
TTGCTGCAAA ATAAAGAGAG CCTATTTTAC AAGATGGTGC AACAACTGGG CAAGGCAGAA   3840
GCCGCTGCCC TCACTGAAAC AGCAAAACAG GTATACTTCA AAAGAAATTA TCCACATATT   3900
GGTCACACTG ACCACATGGT TACAAACACT TCCAATGGAC AGCCCTCGAC CTTAACTATT   3960
TTCGAGACAG CACTGTGA
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SEQ ID NO:42 PBH5 PROTEIN SEQUENCE

Protein Accession #: NP_005836

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1          11         21         31         41         51
|          |          |          |          |          |
MLPVYQEVKP NPLQDANLCS RVFFWWLNPL FKIGHKRRLE EDDMYSVLPE DRSQHLGEEL    60
QGFWDKEVLR AENDAQKPSL TRAIIKCYWK SYLVLGIFTL IEESAKVIQP IFLGKIINYF   120
ENYDPMDSVA LNTAYAYATV LTFCTLILAI LHHLYFYHVQ CAGMRLRVAM CHMIYRKALR   180
LSNMAMGKTT TGQIVNLLSN DVNKFDQVTV FLHFLWAGPL QAIAVTALLW MEIGISCLAG   240
MAVLIILLPL QSCFGKLFSS LRSKTATFTD ARIRTMNEVI TGIRIIKMYA WEKSFSNLIT   300
NLRKKEISKI LRSSCLRGMN LASFFSASKI IVFVTFTTYV LLGSVITASR VFVAVTLYGA   360
VRLTVTLFFP SAIERVSEAI VSIRRIQTFL LLDEISQRNR QLPSDGKKMV HVQDFTAFWD   420
KASETPTLQG LSFTVRPGEL LAVVGPVGAG KSSLLSAVLG ELAPSHGLVS VHGRIAYVSQ   480
QPWVFSGTLR SNILFGKKYE KERYEKVIKA CALKKDLQLL EDGDLTVIGD RGTTLSGGQK   540
ARVNLARAVY QDADIYLLDD PLSAVDAEVS RHLFELCICQ ILHEKITILV THQLQYLKAA   600
SQILILKDGK MVQKGTYTEF LKSGIDFGSL LKKDNEESEQ PPVPGTPTLR NRTFSESSVW   660
SQQSSRPSLK DGALESQDTE NVPVTLSEEN RSEGKVGFQA YKNYFRAGAH WIVFIFLILL   720
NTAAQVAYVL QDWWLSYWAN KQSMLNVTVN GGGNVTEKLD LNWYLGIYSG LTVATVLFGI   780
ARSLLVFYVL VNSSQTLHNK MFESILKAPV LFFDRNPIGR ILNRFSKDIG HLDDLLPLTF   840
LDFIQTLLQV VGVVSVAVAV IPWIAIPLVP LGIIFIFLRR YFLETSRDVK RLESTTRSPV   900
FSHLSSSLQG LWTIRAYKAE ERCQELFDAH QDLHSEAWFL FLTTSRWFAV RLDAICAMFV   960
IIVAFGSLIL AKTLDAGQVG LALSYALTLM GMFQWCVRQS AEVENMMISV ERVIEYTDLE  1020
KEAPWEYQKR PPPAWPHEGV IIFDNVNFMY SPGGPLVLKH LTALIKSQEK VGIVGRTGAG  1080
KSSLISALFR LSEPEGKIWI DKILTTEIGL HDLRKKMSII PQEPVLFTGT MRKNLDPFNE  1140
HTDEELWNAL QEVQLKETIE DLPGKMDTEL AESGSNFSVG QRQLVCLARA ILRKNQILII  1200
DEATANVDPR TDELIQKKIR EKFAHCTVLT IAHRLNTIID SDKIMVLDSG RLKEYDEPYV  1260
LLQNKESLFY KMVQQLGKAE AAALTETAKQ VYFKRNYPHI GHTDHMVTNT SNGQPSTLTI  1320
FETAL
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SEQ ID NO:43 PBQ7 DNA SEQUENCE

Nucleic Acid Accession #: NM_021233

Coding sequence: 34-1119 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
|          |          |          |          |          |
ATGGGGAAAG TGTCCTGCTG TGGCATGAAA TAAATGAAAC AGAAAATGAT GGCAAGACTG    60
CTAAGAACAT CCTTTGCTTT GCTCTTCCTT GGCCTCTTTG GGGTGCTGGG GGCAGCAACA   120
ATTTCATGCA GAAATGAAGA AGGGAAAGCT GTGGACTGGT TTACTTTTTA TAAGTTACCT   180
AAAAGACAAA ACAAGGAAAG TGGAGAGACT GGGTTAGAGT ACCTGTACCT AGACTCTACA   240
ACTAGAAGCT GGAGGAAGAG TGAGCAACTA ATGAATGACA CCAAGAGTGT TTTGGGAAGG   300
ACATTACAAC AGCTATATGA AGCATATGCC TCTAAGAGTA ACAACACAGC CTATCTAATA   360
TACAATGATG GAGTCCCTAA ACCTGTGAAT TACAGTAGAA AGTATGGACA CACCAAAGGT   420
TTACTGCTGT GGAACAGAGT TCAAGGGTTC TGGCTGATTC ATTCCATCCC TCAGTTTCCT   480
CCAATTCCGG AAGAAGGCTA TGATTATCCA CCCACAGGGA GACGAAATGG ACAAAGTGGC   540
ATCTGCATAA CTTTCAAGTA CAACCAGTAT GAGGCAATAG ATTCTCAGCT CTTGGTCTGC   600
AACCCCAACG TCTATAGCTG CTCCATCCCA GCCACCTTTC ACCAGGAGCT CATTCACATG   660
CCCCAGCTGT GCACCAGGGC CAGCTCATCA GAGATTCCTG GCAGGCTCCT CACCACACTT   720
CAGTCGGCCC AGGGACAAAA ATTCCTCCAT TTTGCAAAGT CGGATTCTTT TCTTGACGAC   780
ATCTTTGCAG CCTGGATGGC TCAACGGCTG AAGACACACT TGTTAACAGA AACCTGGCAG   840
CGAAAAAGAC AAGAGCTTCC TTCAAACTGC TCCCTTCCTT ACCATGTCTA CAATATAAAA   900
GCAATTAAAT TATCACGACA CTCTTATTTC AGTTCTTATC AAGATCACGC CAAGTGGTGT   960
ATTTCCCAAA AGGGCACCAA AAATCGCTGG ACATGTATTG GAGACCTAAA TCGGAGTCCA  1020
CACCAAGCCT TCAGAAGTGG AGGATTCATT TGTACCCAGA ATTGGCAAAT TTACCAAGCA  1080
TTTCAAGGAT TAGTATTATA CTATGAAAGC TGTAAGTAAA CTTGGTGAAA GGACACAGGT
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SEQ ID NO:44 PBQ7 Protein sequence

Protein Accession #: NP_067056

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1          11         21         31         41         51
|          |          |          |          |          |
MMARLLRTSF ALLFLGLFGV LGAATISCRN EEGKAVDWFT PYKLPKRQNK ESGETGLEYL    60
YLDSTTRSWR KSEQLMNDTK SVLGRTLQQL YEAYASKSNN TAYLIYNDGV PKPVNYSRKY   120
GHTKGLLLWN RVQGFWLIHS IPQFPPIPEE GYDYPPTGRR NGQSGICITF KYNQYEAIDS   180
QLLVCNPNVY SCSIPATFHQ ELIHMPQLCT RASSSEIPGR LLTTLQSAQG QKFLHFAKSD   240
SFLDDIFAAW MAQRLKTHLL TETWQRKRQE LPSNCSLPYH VYNIKAIKLS RHSYFSSYQD   300
HAKWCISQKG TKNRWTCIGD LNRSPHQAFR SGGFICTQNW QIYQAFQGLV LYYESCK
```

SEQ ID NO:45 PCQ8 DNA SEQUENCE

Nucleic Acid Accession #: XM_030453

Coding sequence: 89-1273 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
|          |          |          |          |          |
CGGTGCCCTG GGGTGGAATA TCCCCTACGA ATTTAACCAA GCGGACTTTA ATGCCACTGT    60
GCAGTTCATC CAAAACCACT TGGATGACAT GGATGTCAAA AAGGGTGTCT CCTGGACCAC   120
CATCCGCTAC ATGATAGGAG AGATTCAATA TGGAGGCAGA GTCACTGACG ACTATGATAA   180
GAGATTGTTG AACACATTTG CTAAGGTTTG GTTCAGTGAA AATATGTTTG GACCAGATTT   240
CAGTTTTTAC CAAGGATACA ATATTCCAAA ATGCAGCACA GTGGATAACT ATCTTCAGTA   300
TATCCAGAGT TTGCCTGCCT ATGACAGCCC TGAGGTGTTT GGGCTGCACC CCAATGCTGA   360
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CATCACCTAC CAGAGCAAGC TGGCCAAGGA CGTGCTGGAC ACCATCCTAG GCATCCAACC   420
CAAGGACACC TCTGGTGGAG GGGATGAGAC CCGGGAGGCG GTGGTGGCCC GGCTGGCTGA   480
TGATATGCTG GAGAAGCTGC CCCCAGACTA TGTCCCCTTT GAAGTAAAAG AGAGGCTGCA   540
GAAGATGGGG CCATTCCAGC CTATGAACAT TTTCCTCAGG CAGGAAATAG ACAGAATGCA   600
AAGGGTACTC AGCCTTGTCC GCAGCACCCT CACTGAGCTG AAACTTGCTA TTGATGGCAC   660
CATCATCATG AGCGAAAATC TGCAAGATGC ATTGGATTGC ATGTTTGATG CTAGAATCCC   720
TGCTTGGTGG AAAAAAGCTT CTTGGGTTTT TAGTACACTG GGTTTCTGGT TTACTGAACT   780
TATAGAAAGA AACAGCCAGT TTACCTCGTG GGTTTTCAAT GGCCGACCTC ACTGCTTTTG   840
GATGACGGGT TTTTTTAACC CCCAGGGATT TTTAACTGCA ATGCGACAGG AAATAACTCG   900
GGCCAACAAA GGCTGGGCTC TGGACAATAT GGTGCTTTGC AATGAAGTCA CCAAATGGAT   960
GAAGGACGAC ATTTCTACCC CTCCCACAGA GGGTGTCTAT GTCTATGGCT TATATCTTGA  1020
AGGTGCTGGC TGGGACAAGA GGAACATGAA ACTCATTGAA TCAAAGCCAA AAGTGCTCTT  1080
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SEQ ID NO:46 PCQ8 Protein sequence
Protein Accession #: BAB15543

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WVFNGRPHCF WMTGFFNPQG FLTAMRQEIT RANKGWALDN MVLCNEVTKW MKDDISTPPT   300
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SEQ ID NO:47 PDG5 DNA SEQUENCE

Nucleic Acid Accession #: AB033036
Coding sequence: 68-3349 (underlined sequences correspond to start and stop codons)

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SEQ ID NO:48 PDG5 Protein sequence
Protein Accession #: BAA86524

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SEQ ID NO:49 PAB7 DNA SEQUENCE

Nucleic Acid Accession #: D87742
Coding sequence: 208-3582 (underlined sequences correspond to start and stop codons)

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TTAGCCATGT AAAAATAAGA TTAAGTCACA AATACAACTT TTGAATTTAC CTGTCAATAT 5340
CTCTTTAGGA CACAAAACAA TGCTGAAGTT AATATAATTT CTAATTTTAA ATGTCATTTA 5400
AGTGTAGATT ATGCCATCTA GGAAGGTAAG TAGGAAAGGT AAATTAAATC TATTTTTAAA 5460
ATTCAAAATA TTAGAGTATT TTTCCCCTCT AAAGCCTTTT TTGGTGATTA TTCTGTATCT 5520
GACATAATTG AGAAACTGGT AAGCTGTAAA GATTCCAGTG TAGCTTCTCT GAGAAGTTGT 5580
GAGCCAGTCC ATAACTGCTT CCTCACATCC ATCTGATTGC ACCATTTCTG CAGCAAACCC 5640
CAAAGCAGGG TGCCAATATG CAGATGGCAT AGGGAGTATC ATCCCTCAGC CAAATCACTT 5700
TTCCATCTCT AAAGTTTCAT CTATTTTGGA AGTCATCTCC AACTAATTGT GTCTGGATTT 5760
AGTTGCTAAA ATTGTCTTAT TTATTTATGA AGCAGCAATA TTCAGCCTGA AAGCATTTCT 5820
GCCATAGTTG TTGTAGTTAT ATCGCCAATG GCTGATTTTT TTCATTGGAA AGTAAATTTA 5880
AGTAATTCGT GGGATGTGGT ATATTCTGTG TCAACTTCAA GATAATCACT CATTTTCTCG 5940
TTATATTCAG GTCTGAATTA AAGTTAAGTT AATCAC

SEQ ID NO:50 PAB7 Protein sequence
Protein Accession #: BAA13448

1 11 21 31 41 51
| | | | | |
AFLSKVEEDD YPSEELLEDE NAINAKRSKE KNPGNQGRQF DVNLQVPDRA VLGTIHPDPE 60
IEESKQETSM ILDSEKTSET AAKGVNTGGR EPNTMVEKER PLADKKAQRP FERSDFSDSI 120
KIQTPELGEV FQNKDSDYLK NDNPEEHLKT SGLAGEPEGE LSKEDHGNTE KYMGTESQGS 180
AAAEPEDDSF HWTPHTSVEP GHSDKREDLL IISSFFKEQQ SLQRFQKYFN VHELEALLQE 240
MSSKLKSAQQ ESLPYNMEKV LDKVFRASES QILSIAEKML DTRVAENRDL GMNENNIFEE 300
AAVLDDIQDL IYFVRYKHST AEETATLVMA PPLEEGLGGA MEEMQPLHED NFSREKTAEL 360
NVQVPEEPTH LDQRVIGDTH ASEVSQKPNT EKDLDPGPVT TEDTPMDAID ANKQPETAAE 420
EPASVTPLEN AILLIYSFMF YLTKSLVATL PDDVQPGPDF YGLPWKPVFI TAFLGIASFA 480
IFLWRTVLVV KDRVYQVTEQ QISEKLKTIM KENTELVQKL SNYEQKIKES KKHVQETRKQ 540
NMILSDEAIK YKDKIKTLEK NQEILDDTAK NLRVMLESER EQNVKNQDLI SENKKSIEKL 600
KDVISMNASE FSEVQIALNE AKLSEEKVKS ECHRVQEENA RLKKKKEQLQ QEIEDWSKLH 660
AELSEQIKSF EKSQKDLEVA LTHKDDNINA LTNCITQLNL LECESESEGQ NKGGNDSDEL 720
ANGEVGGDRN EKMKNQIKQM MDVSRTQTAI SVVEEDLKLL QLKLRASVST KCNLEDQVKK 780
LEDDRNSLQA AKAGLEDECK TLRQKVEILN ELYQQKEMAL QKKLSQEEYE RQEREHRLSA 840
ADEKAVSAAE EVKTYKRRIE EMEDELQKTE RSFKNQIATH EKKAHENWLK ARAAERAIAE 900
EKREAANLRH KLLELTQKMA MLQEEPVIVK PMPGKPNTQN PPRRGPLSQN GSFGPSPVSG 960
GECSPPLTVE PPVRPLSATL NRRDMPRSEF GSVDGPLPHP RWSAEASGKP SPSDPGSGTA 1020
TMMNSSSRGS SPTRVLDEGK VNMAPKGPPP FPGVPLMSTP MGGPVPPPIR YGPPPQLCGP 1080
FGPRPLPPPF GPGMRPPLGL REFAPGVPPG RRDLPLHPRG FLPGHAPFRP LGSLGPREYF 1140
IPGTRLPPPT HGPQEYPPPP AVRDLLPSGS RDEPPPASQS TSQDCSQALK QSP

SEQ ID NO:51 PAB9 DNA SEQUENCE

Nucleic Acid Accession #: NM_006457
Coding sequence: 84-1874 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
| | | | | |
AGACTGAGGC GGAGGCAGCC CCGCGCCGCG CCGGACCCGA GCATATTTCA TTTTCTGTCA 60

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TTGGACTTTG AGCCATTAGA ACCATGAGCA ACTACAGTGT GTCACTGGTT GGCCCAGCTC   120
CTTGGGGTTT CCGGCTGCAG GGCGGTAAGG ATTTCAACAT GCCTCTGACA ATCTCTAGTC   180
TAAAAGATGG CGGCAAGGCA GCCCAGGCAA ATGTAAGAAT AGGCGATGTG GTTCTCAGCA   240
TTGATGGAAT AAATGCACAA GGAATGACTC ATCTTGAAGC CCAGAATAAG ATTAAGGGTT   300
GTACAGGCTC TTTGAATATG ACTCTGCAAA GAGCATCTGC TGCACCCAAG CCTGAGCCGG   360
TTCCTGTTCA AAAGGGAGAA CCTAAAGAAG TAGTTAAACC TGTGCCCATT ACATCTCCTG   420
CTGTGTCCAA AGTCACTTCC ACAAACAACA TGGCCTACAA TAAGGCACCA CGGCCTTTTG   480
GTTCTGTGTC TTCACCAAAA GTCACATCCA TCCCATCACC ATCGTCTGCC TTCACCCCAG   540
CCCATGCGAC CACCTCATCA CATGCTTCCC CTTCACCCGT GGCTGCCGTC ACTCCTCCCC   600
TGTTCGCTGC ATCTGGACTG CATGCTAATG CCAATCTTAG TGCTGACCAG TCTCCATCTG   660
CACTGAGCGC TGGTAAAACT GCAGTTAATG TCCCACGGCA GCCCACAGTC ACCAGCGTGT   720
GTTCCGAGAC TTCTCAGGAG CTAGCAGAGG GACAGAGAAG AGGATCCCAG GGTGACAGTA   780
AACAGCAAAA TGGCCCACCA AGAAAACACA TTGTGGAGCG CTATACAGAG TTTTATCATG   840
TACCCACTCA CAGTGATGCC AGCAAGAAGA GACTGATTGA GGATACTGAA GACTGGCGTC   900
CAAGAACTGG AACAACTCAG TCTCGCTCTT TCCGAATCCT TGCCCAGATC ACTGGGACTG   960
AACATTTGAA AGAATCTGAA GCCGATAATA CAAAGAAGGC AAATAACTCT CAGGAGCCTT  1020
CTCCGCAGTT GGCTTCCTTG GTAGCTTCCA CACGGAGCAT GCCCGAGAGC CTGGACAGCC  1080
CAACCTCTGG CAGACCAGGG GTTACCAGCC TCACAACTGC AGCTGCCTTC AAGCCTGTAG  1140
GATCCACTGG CGTCATCAAG TCACCAAGCT GGCAACGGCC AAACCAAGGA GTACCTTCCA  1200
CTGGAAGAAT CTCAAACAGC GCTACTTACT CAGGATCAGT GGCACCAGCC AACTCAGCTT  1260
TGGGACAAAC CCAGCCAAGT GACCAGGACA CTTTAGTGCA AAGAGCTGAG CACATTCCAG  1320
CAGGGAAACG AACTCCGATG TGCGCCCATT GTAACCAGGT CATCAGAGGA CCATTCTTAG  1380
TGGCACTGGG GAAATCTTGG CACCCAGAAG AATTCAACTG CGCTCACTGC AAAAATACAA  1440
TGGCCTACAT TGGATTTGTA GAGGAGAAAG GAGCCCTGTA TTGTGAGCTG TGCTATGAGA  1500
AATTCTTTGC CCCTGAATGT GGTCGATGCC AAAGGAAGAT CCTTGGAGAA GTCATCAATG  1560
CGTTGAAACA AACTTGGCAT GTTTCCTGTT TTGTGTGTGT AGCCTGTGGA AAGCCCATTC  1620
GGAACAATGT TTTTCACTTG GAGGATGGTG AACCCTACTG TGAGACTGAT TATTATGCCC  1680
TCTTTGGTAC TATATGCCAT GGATGTGAAT TTCCCATAGA AGCTGGTGAC ATGTTCCTGG  1740
AAGCTCTGGG CTACACCTGG CATGACACTT GCTTTGTATG CTCAGTGTGT TGTGAAAGTT  1800
TGGAAGGTCA GACCTTTTTC TCCAAGAAGG ACAAGCCCCT GTGTAAGAAA CATGCTCATT  1860
CTGTGAATTT TTGAAAGTCA ACAGTTCAGG AGAAGAGAAG GAATTTGAAG AGAAAAAGGA  1920
AAATTAAAAT TACTAATTAA TTTTTAGATT CAATATTTAT ATGGAGTTTT GAAAAATAAT  1980
AGTGGCCCTG AAGGAATAAA TTCCAGCTTT AAAAACCAAG TCTGAGGAAA TATTTGGCTT  2040
CATAAAGTAA AGAGACGGTT TGGCATTTAT TATTACTTTT TCCTGTATTT TATGCCCATA  2100
AAATAAGCTT TATAAAAACC AATTTCCTGA TGGACTATTA AATTCATCTT AGAATAAATT  2160
AGTGAAGAAT TTAATTTTAG AATAAATAAT CCAATCTGAA ATAATTATAC CTTCTTTCCT  2220
TGTTAGGTAG TTATGAGTAA ATCTGCAAAA GGCAATGAAA ATGCCTTAAA TTTTATCAAT  2280
AACAGAATTA TTGTATTTAA AAAAAAACTA ATACTTATCT TTAAAATAGT AAATAGGATT  2340
TTAAACAGAG AATTTTATCA GTAATAGGTG TCAGTTTTTA AAAAATTGCT TGTAGGCTGA  2400
GCGCGGTGGC TCACGCCTGT AATCCCAGCA CTTTGGGAGG CCAAGGTGGG TGGACCACAT  2460
GAGGTCAGGA GTTTGAGATC AGCCTGGCCA ACATGGTGAA ACCCCATCTC TACTAAAAAT  2520
ACAAAAATTA GCCGGACGCA GTGGCACGCG CCTGTAATCC CAGCTACTCA AGAGGCTGAG  2580
GCACGAGAAT CACTTGAACC CGGGAGGGAG AGGTTGCAGT GAGCCAAGAT CGTACCACTG  2640
CACTCCAGCC TGGGTGACAG AGTGAGACTC CGTCTCCAAA AAAAAACTTT GCTTGTATAT  2700
TATTTTTGCC TTACAGTGGA TCATTCTAGT AGGAAAGGAC AATAAGATTT TTTATCAAAA  2760
TGTGTCATGC CAGTAAGAGA TGTTATATTC TTTTCTTATT TCTTCCCCAC CCAAAAATAA  2820
GCTACCATAT AGCTTATAAG TCTCAAATTT TTGCCTTTTA CTAAAATGTG ATTGTTTCTG  2880
TTCATTGTGT ATGCTTCATC ACCTATATTA GGCAAATTCC ATTTTTTCCC TTGCGCTAAG  2940
GTAAAGATTT AATTAAATAA TTTTGGCCTC TCATAGTTTT CTCTCTCTTT AAAGAGAATA  3000
AATAGAGGGC CAGGTGTGGT GGCTCACGCC TGTGATCCCA GCACTTTGGG AGGCCAAGAC  3060
GGGCGGATCA TGAGGTCAAG AGATCAAGAT CATCCTGGCC AACATGGTGA AACCCTGTCT  3120
CTACTAAAAA TACAAAAATG AGCTGGGCAT GGTGGGGCGT GCCTGTAGTC CCATGTACTT  3180
GGGAGGCTGA GGCAGGAAAA TTCTTGAACC CAGGAGACGG AAGTTGCAGT GAGCTGAGAT  3240
CACACCACTG CACTCCAGCC TGGTGACAGA GCAAGACTCC GGCTCTT
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SEQ ID NO:52 PAB9 Protein sequence
Protein Accession #: NP_006448

```
    1          11         21         31         41         51
    |          |          |          |          |          |
  1 MSNYSVSLVG PAPWGFRLQG GKDFNMPLTI SSLKDGGKAA QANVRIGDVV LSIDGINAQG    60
 61 MTHLEAQNKI KGCTGSLNMT LQRASAAPKP EPVPVQKGEP KEVVKPVPIT SPAVSKVTST   120
121 NNMAYNKAPR PFGSVSSPKV TSIPSPSSAF TPAHATTSSH ASPSPVAAVT PPLFAASGLH   180
181 ANANLSADQS PSALSAGKTA VNVPRQPTVT SVCSETSQEL AEGQRRGSQG DSKQQNGPPR   240
241 KHIVERYTEF YHVPTHSDAS KKRLIEDTED WRPRTGTTQS RSFRILAQIT GTEHLKESEA   300
301 DNTKKANNSQ EPSPQLASLV ASTRSMPESL DSPTSGRPGV TSLTTAAAFK PVGSTGVIKS   360
361 PSWQRPNQGV PSTGRISNSA TYSGSVAPAN SALGQTQPSD QDTLVQRAEH IPAGKRTPMC   420
421 AHCNQVIRGP FLVALGKSWH PEEFNCAHCK NTMAYIGFVE EKGALYCELC YEKFFAPECG   480
481 RCQRKILGEV INALKQTWHV SCFVCVACGK PIRNNVFHLE DGEPYCETDY YALFGTICHG   540
541 CEFPIEAGDM FLEALGYTWH DTCFVCSVCC ESLEGQTFFS KKDKPLCKKH AHSVNF
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SEQ ID NO:53 PBH7 DNA SEQUENCE

Nucleic Acid Accession #: AA431407
Coding sequence: 1-864 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
|          |          |          |          |          |
ATGGCCAACT GTAAAATGAC CAAAAGCATC AGGTTCCCTG CCCTGGAGCA CTGCTATACT    60
GGCGGGGAGG TCGTGTTGCC CAAGGATCAG GAGGAGTGGA AAAGACGGAC GGGCCTTCTG   120
CTCTACGAGA ACTATGGGCA GTCGGAAACG GGACTAATTT GTGCCACCTA CTGGGGAATG   180
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AAGATCAAGC CGGGTTTCAT GGGGAAGGCC ACTCCACCCT ATGACGTCCA GTTTCATATG   240
GAGGCCTCAG TTGAAAACTG CATTATTGTG AGCATGAACA CCGCTGACCC TGGCAGCCAG   300
GGCATCACAC ACAGCCTCTT GCTACAGGTC ATTGATGACA AGGGCAGCAT CCTGCCACCT   360
AACACAGAAG GAAACATTGG CATCAGAATC AAACCTGTCA GGCCTGTGAG CCTCTTCATG   420
TGCTATGAGG GTGACCCAGA GAAGACAGCT AAAGTGGAAT GTGGGGACTT CTACAACACT   480
GGGGACAGAG GAAAGATGGA TGAAGAGGGC TACATTTGTT TCCTGGGGAG GAGTGATGAC   540
ATCATTAATG CCTCTGGGTA TCGCATCGGG CCTGCAGAGG TTGAAAGCGC TTTGGTGGAG   600
CACCCAGCGG TGGCGGAGTC AGCCGTGGTG GGCAGCCCAG ACCCGATTCG AGGGGAGGTG   660
GTGAAGGCCT TTATTGTCCT GACCCCACAG TTCCTGTCCC ATGACAAGGA TCAGCTGACC   720
AAGGAACTGC AGCAGCATGT CAAGTCAGTG ACAGCCCCAT ACAAGTACCC AAGGAAGGTG   780
GAGTTTGTCT CAGAGCTGCC AAAAACCATC ACTGGCAAGA TTGAACGGAA GGAACTTCGG   840
AAAAAGGAGA CTGGTCAGAT GTAATCGGCA GTGAACTCAG AACGCACTGC ACACCTGAGG   900
CAAATCCCTG GCCACTTTAG TCTCCCCACT ATGGTGAGGA CGAGGGTGGG GCATTGAGAG   960
TGTTGATTTG GGAAAGTATC AGGAGTGCCA TGATTCCAAT GTTTTCCTTC TTTTAAATTA  1020
AATTCAGTTG CTCTGCTTCC TCCAAGTCCT CTGTATCTTT AGAATTTCCC AGGTGAGCAC  1080
TCATAACGCA AGTAATAAAA TACTGATATC AACAA
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SEQ ID NO:54 PBH7 Protein sequence

Protein Accession #: FGENESH predicted

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1          11         21         31         41         51
|          |          |          |          |          |
MANCKMTKSI RFPALEHCYT GGEVVLPKDQ EEWKRRTGLL LYENYGQSET GLICATYWGM    60
KIKPGFMGKA TPPYDVQFHM EASVENCIIV SMNTADPGSQ GITHSLLLQV IDDKGSILPP   120
NTEGNIGIRI KPVRPVSLFM CYEGDPEKTA KVECGDFYNT GDRGKMDEEG YICFLGRSDD   180
IINASGYRIG PAEVESALVE HPAVAESAVV GSPDPIRGEV VKAFIVLTPQ FLSHDKDQLT   240
KELQQHVKSV TAPYKYPRKV EFVSELPKTI TGKIERKELR KKETGQM
```

SEQ ID NO:55 PBJ5 DNA SEQUENCE

Nucleic Acid Accession #: AF388200

Coding sequence: 33-137 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
GAGAGAGGGA GGCAGAAGAG GAAGTCAGAG CGATGTGCTG TGAAATCTAC TACCGTTTGC    60
TGGTTTTGAA AATGGAGAAA AAGAGTGAGG AACTGAGAAA CATGGATGGC CTTGGGAACG   120
TGGAAAAGGG TCACTGAAAT GGGACGACAT GAACTCAAGG AGGCTATTTA TGACCATGTC   180
ATTTGCAACA TGAAGAAAGC TTATCTGGAG TGAAAGTAAA TGAGACCAAC AGAGATAAGA   240
GACCCGGAGA AATCCTGGTT ACACTGCTTG AATCCTGTCA GTCCTATACT GGAGTCCTGT   300
TAATACAAAA TAATAGTAAT AATCCCTCTG TTTCTTATGT TTATGCCAAC TTCAACAAAA   360
AGAAACTTGA CTAAGAGACA ATATAAGAAC TTAATGTGTA ATTAAGAAAG AACTCTCCAC   420
CACGGGGAAT GTGAAAGGTA TATGAGTCCC TTTTCACGAT GCGATGTCAT GTCTTTTAAA   480
TAAGCCATAC TTTATGTTCA ATAAAAAGAG AATAAGCAGG A
```

SEQ ID NO:56 PBJ5 Protein sequence

Protein Accession #: AAK83352

```
1          11         21         31         41         51
|          |          |          |          |          |
MCCEIYYRLL VLKMEKKSEE LRNMDGLGNV EKGH
```

SEQ ID NO:57 PBJ7 DNA SEQUENCE

Nucleic Acid Accession #: AA876910

Coding sequence: 1-2064 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
|          |          |          |          |          |
ATGGACAGTT GCCTGCAACA TATGAGAGAC CTACTTTACC TCCTTCAGGA GCTCAGGTGT    60
TTAAATCCAG CTACACTACT CCCTGATCCA GACTCCACTA CTCCTGTTCA TGACTGTCAG   120
GATCTGTTGG AAACTACCAA AACTGGCCAA CCTGATCTTC AAGATGTGCC CCTAGAAAAG   180
GCAGATGCCA CTGTGTTCAC AGATGGTAGC AGCTTCCTCG AGCAGGGAGA ACGAAAAGCT   240
GTTTCTTTTC CACAGCCAGA TCTGCCTGAC AATCCCACAT ACTCAACAGA AGAAGAAAAA   300
CTGGCTTCAG ATGTTGGAGC AAATAAAAAT CAGGAAGGAC GTGTATTCGC AAACACTACT   360
TGGAGGGCCG GTACCTCCAA GGAAGTCTCC TTTGCAGTTG ATTTATGTGT ACTGTTCCCA   420
GAGCCAGCTC GTACCCATGA AGAGCAACAT AATTTGCCGG TCATAGGAGC AGGAAGTGTC   480
GACCTTGCAG CAGGATTTGG ACACTCTGGG AGCCAAACTG GATGTGGAAG CTCCAAAGGT   540
GCAGAAAAAG GGCTCCAAAA TGTTGACTTT TACCTCTGTC CTGGAAATCA CCCTGACGCT   600
AGCTGTAGAG ATACTTACCA GTTTTTCTGC CCTGATTGGA CATGTGTAAC TTTAGCCACC   660
TACTCTGGGG GATCAACTAG ATCTTCAACT CTTTCCATAA GTCGTGTTCC TCATCCTAAA   720
TTATGTACTA GAAAAAATTG TAATCCTCTT ACTATAACTG TCCATGACCC TAATGCAGCT   780
CAATGGTATT ATGGCATGTC ATGGGGATTA AGACTTTATA TCCCAGGATT TGATGTTGGG   840
ACTATGTTCA CCATCCAAAA GAAAATCTTG GTCTCATGGA GCTCCCCCAA GCCAATCGGG   900
CCTTTAACTG ATCTAGGTGA CCCTATATTC CAGAAACACC CTGACAAAGT TGATTTAACT   960
GTTCCTCTGC CATTCTTAGT TCCTAGACCC CAGCTACAAC AACAACATCT TCAACCCAGC  1020
CTAATGTCTA TACTAGGTGG AGTACACCAT CTCCTTAACC TCACCCAGCC TAAACTAGCC  1080
CAAGATTGTT GGCTATGTTT AAAAGCAAAA CCCCCTTATT ATGTAGGATT AGGAGTAGAA  1140
GCCACACTTA AACGTGGCCC TCTATCTTGT CATACACGAC CCCGTGCTCT CACAATAGGA  1200
GATGTGTCTG GAAATGCTTC CTGTCTGATT AGTACCGGGT ATAACTTATC TGCTTCTCCT  1260
TTTCAGGCTA CTTGTAATCA GTCCCTGCTT ACTTCCATAA GCACCTCAGT CTCTTACCAA  1320
GCACCCAACA ATACCTGGTT GGCCTGCACC TCAGGTCTCA CTCGCTGCAT TAATGGAACT  1380
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GAACCAGGAC CTCTCCTGTG CGTGTTAGTT CATGTACTTC CCCAGGTATA TGTGTACAGT 1440
GGACCAGAAG GACGACAACT CATCGCTCCC CCTGAGTTAC ATCCCAGGTT GCACCAAGCT 1500
GTCCCACTTC TGGTTCCCCT ATTGGCTGGT CTTAGCATAG CTGGATCAGC AGCCATTGGT 1560
ACGGCTGCCC TGGTTCAAGG AGAAACTGGA CTAATATCCC TGTCTCAACA GGTGGATGCT 1620
GATTTTAGTA ACCTCCAGTC TGCCATAGAT ATACTACATT CCCAGGTAGA GTCTCTGGCT 1680
GAAGTAGTTC TTCAAAACTG CCGATGCTTA GATCTGCTAT TCCTCTCTCA AGGAGGTTTA 1740
TGTGCAGCTC TAGGAGAAAG TTGTTGCTTC TATGCCAATC AATCTGGAGT CATAAAAGGT 1800
ACAGTAAAAA AAGTTCGAGA AAATCTAGAT AGGCACCAAC AAGAACGAGA AAATAACATC 1860
CCCTGGTATC AAAGCATGTT TAACTGGAAC CCATGGCTAA CTACTTTAAT CACTGGGTTA 1920
GCTGGACCTC TCCTCATCCT ACTATTAAGT TTAATTTTTG GGCCTTGTAT ATTAAATTCG 1980
TTTCTTAATT TTATAAAACA ACGCATAGCT TCTGTCAAAC TTACGTATCT TAAGACTCAA 2040
TATGACACCC TTGTTAATAA CTGA

SEQ ID NO:58 PBJ7 Protein sequence
Protein Accession #: FGENESH predicted

1 11 21 31 41 51
| | | | | |
MDSCLQHMRD LLYLLQELRC LNPATLLPDP DSTTPVHDCQ DLLETTKTGQ PDLQDVPLEK 60
ADATVFTDGS SFLEQGERKA VSFPQPDLPD NPTYSTEEEK LASDVGANKN QEGRVFANTT 120
WRAGTSKEVS FAVDLCVLFP EPARTHEEQH NLPVIGAGSV DLAAGFGHSG SQTGCGSSKG 180
AEKGLQNVDF YLCPGNHPDA SCRDTYQFFC PDWTCVTLAT YSGGSTRSST LSISRVPHPK 240
LCTRKNCNPL TITVHDPNAA QWYYGMSWGL RLYIPGFDVG TMFTIQKKIL VSWSSPKPIG 300
PLTDLGDPIF QKHPDKVDLT VPLPFLVPRP QLQQQHLQPS LMSILGGVHH LLNLTQPKLA 360
QDCWLCLKAK PPYYVGLGVE ATLKRGPLSC HTRPRALTIG DVSGNASCLI STGYNLSASP 420
FQATCNQSLL TSISTSVSYQ APNNTWLACT SGLTRCINGT EPGPLLCVLV HVLPQVYVYS 480
GPEGRQLIAP PELHPRLHQA VPLLVPLLAG LSIAGSAAIG TAALVQGETG LISLSQQVDA 540
DFSNLQSAID ILHSQVESLA EVVLQNCRCL DLLFLSQGGL CAALGESCCF YANQSGVIKG 600
TVKKVRENLD RHQQERENNI PWYQSMFNWN PWLTTLITGL AGPLLILLLS LIFGPCILNS 660
FLNFIKQRIA SVKLTYLKTQ YDTLVNN

SEQ ID NO:59 PCQ1 DNA SEQUENCE

Nucleic Acid Accession #: NM_019005
Coding sequence: 182-1885 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
| | | | | |
TGATGGTGGA AATTTCTTGA AACCGCTCTC GTAATTTGCC ACGTGCTGTT GCAAATATTC 60
TGGTGAATGA ACACAGAATC AGCATGGCTT TCCTTTGCTG AGAAATCACT GATGGGAAGT 120
GAGACTTGTT AAACTTGAAA GTGAATGGAC CTGAGTGGAC CCTTTGATCA CATCAGTAAA 180
CATGAGCGGT ACCAAACCTG ATATTTTATG GGCACCACAC CATGTTGATA GATTTGTTGT 240
GTGTGACTCA GAACTAAGTC TTTATCATGT GGAATCTACT GTGAATTCAG AACTCAAAGC 300
TGGATCTTTA CGTTTATCTG AAGACTCTGC AGCTACATTA CTGTCAATAA ATTCAGATAC 360
ACCCTATATG AAATGTGTTG CCTGGTATCT TAATTATGAT CCTGAATGTC TGCTGGCAGT 420
TGGACAAGCA AATGGTCGAG TTGTACTTAC AAGCCTTGGT CAAGATCATA ACTCAAAGTT 480
CAAAGATTTG ATAGGAAAAG AGTTTGTTCC AAAACATGCA CGACAATGTA ATACCCTTGC 540
CTGGAATCCA CTGGATAGTA ACTGGCTAGC TGCTGGTTTA GATAAGCACA GAGCTGACTT 600
TTCAGTGCTA ATATGGGATA TCTGCAGCAA ATATACTCCT GATATAGTTC CCATGGAAAA 660
AGTGAAACTT TCAGCAGGTG AAACTGAAAC AACATTATTA GTAACAAAAC CACTTTATGA 720
GTTAGGACAG AATGATGCTT GTCTGTCTCT TTGTTGGCTT CCACGAGACC AGAAACTTCT 780
CCTTGCTGGT ATGCATCGTA ACCTAGCTAT ATTTGATCTT CGGAATACAA GCCAAAAGAT 840
GTTCGTAAAT ACAAAAGCTG TTCAGGGTGT GACGGTAGAC CCATATTTCC ACGATCGTGT 900
TGCTTCCTTC TATGAAGGTC AGGTTGCAAT ATGGGATCTT AGAAAATTTG AGAAGCCAGT 960
TTTGACATTG ACTGAGCAAC CAAAACCCTT AACAAAAGTA GCATGGTGTC CCACTAGGAC 1020
TGGTCTACTT GCCACTTTAA CAAGGGATAG TAATATTATT AGATTGTATG ATATGCAGCA 1080
TACACCCACT CCCATTGGGG ATGAAACTGA ACCCACAATA ATTGAAAGAA GTGTGCAACC 1140
TTGTGACAAT TACATTGCTT CCTTTGCGTG GCATCCAACA AGTCAAAATC GAATGATAGT 1200
TGTAACTCCC AACCGAACAA TGTCAGACTT CACTGTTTTT GAAAGGATAT CTCTTGCCTG 1260
GAGCCCAATT ACATCTTTAA TGTGGGCTTG TGGTCGTCAT TTATATGAAT GTACGGAAGA 1320
AGAAAATGAT AATTCTTTAG AAAAAGATAT AGCAACGAAG ATGCGTCTTC GGGCTTTATC 1380
AAGGTATGGA CTTGATACAG AGCAGGTGTG GAGGAACCAC ATTTTAGCTG GAAATGAAGA 1440
TCCACAGCTC AAGTCACTCT GGTATACTCT GCACTTTATG AAGCAATACA CAGAAGATAT 1500
GGATCAGAAA TCTCCAGGCA ACAAAGGATC ATTGGTTTAT GCAGGAATTA AATCAATTGT 1560
AAAGTCATCG TTGGGAATGG TGGAAAGCAG CAGACATAAT TGGAGTGGGT TGGATAAGCA 1620
AAGTGATATT CAAAACTTAA ATGAAGAGAG AATCTTAGCT TTACAGCTTT GTGGGTGGAT 1680
AAAGAAAGGA ACGGATGTAG ACGTGGGGCC ATTTTTGAAC TCCCTTGTAC AAGAAGGGGA 1740
ATGGGAAAGA GCTGCTGCTG TGGCATTGTT CAACTTGGAT ATTCGCCGAG CAATCCAAAT 1800
CCTGAATGAA GGGGCATCTT CTGAAAAAGG CAGGAGATCT GAATCTCAAT GTGGTAGCAA 1860
TGGCTTTATC GGGTTATACG GATGAGAAGA ACTCCCTTTG GAGAGAAATG TGTAGCACAC 1920
TGCGATTACA GCTAAATAAC CCGTATTTGT GTGTCATGTT TGCATTTCTG ACAAGTGAAA 1980
CAGGATCTTA CGATGGAGTT TTGTATGAAA ACAAAGTTGC AGTACGTGAC AGAGTGGCAT 2040
TTGCTTGTAA ATTCCTTAGT GATACTCAGA TACATCGAAA AGTTGACCAA TGAAATGAAA 2100
GAGGCTGGAA ATTTGGAAGG AATTTTGCTT ACAGGCCTTA CTAAAGATGG AGTGGACTTA 2160
ATGGAGAGTT ATGTTGATAG AACTGGAGAT GTTCAAACAG CAAGTTACTG TATGTTACAG 2220
GGTTCACCTT TAGATGTTCT TAAAGATGAA AGGGTTCAGT ACTGGATTGA GAATTATAGA 2280
AATTTATTAG ATGCCTGGAG GTTTTGGCAT AAACGAGCTG AATTTGATAT TCACAGGAGT 2340
AAGTTGGATC CCAGTTCCAA GCCTTTAGCA CAAGTTTTTG TGAGTTGCAA TTTCTGTGGC 2400
AAGTCAATCT CCTACAGCTG TTCAGCTGTG CCTCATCAGG GCAGAGGTTT TAGTCAGTAT 2460
GGTGTGAGTG GCTCACCAAC GAAATCTAAA GTCACAAGTT GTCCTGGCTG TCGAAAACCA 2520
CTTCCTCGAT GTGCGCTTTG TCTCATTAAT ATGGGAACAC CAGTTTCTAG CTGTCCTGGA 2580

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GGAACCAAAT CAGATGAAAA AGTGGACTTG AGCAAGGACA AAAAATTAGC CCAATTTAAC  2640
AACTGGTTTA CATGGTGTCA TAATTGCAGG CACGGTGGAC ATGCTGGACA TATGCTTAGT  2700
TGGTTCAGGG ACCATGCAGA GTGCCCTGTG TCTGCATGCA CGTGTAAATG TATGCAGTTG  2760
GATACAACGG GGAATCTGGT ACCTGCAGAG ACTGTCCAGC CATAAAATGT TACCACCTTA  2820
AGAGAACCCT TCAAGTGTGG AGCTTTCTAG TAGGTGTCCT TCATAGCTCA GAAACATACC  2880
TCAGAACAAG CCATTCATGA CTTACCTGTA ATGGGAAAAT AAATCATTCT ATCAGAAAAA  2940
AAAAAAAAAA AAAAAAAAAA
```

SEQ ID NO:60 PCQ1 Protein sequence
Protein Accession #: NP_061878

```
1          11         21         31         41         51
|          |          |          |          |          |
MSGTKPDILW APHHVDRFVV CDSELSLYHV ESTVNSELKA GSLRLSEDSA ATLLSINSDT    60
FYMKCVAWYL NYDPECLLAV GQANGRVVLT SLGQDHNSKF KDLIGKEFVP KHARQCNTLA   120
WNPLDSNWLA AGLDKHRADF SVLIWDICSK YTPDIVPMEK VKLSAGETET TLLVTKPLYE   180
LGQNDACLSL CWLPRDQKLL LAGMHRNLAI FDLRNTSQKM FVNTKAVQGV TVDPYFHDRV   240
ASFYEGQVAI WDLRKFEKPV LTLTEQPKPL TKVAWCPTRT GLLATLTRDS NIIRLYDMQH   300
TPTPIGDETE PTIIERSVQP CDNYIASFAW HPTSQNRMIV VTPNRTMSDF TVFERISLAW   360
SPITSLMWAC GRHLYECTEE ENDNSLEKDI ATKMRLRALS RYGLDTEQVW RNHILAGNED   420
PQLKSLWYTL HFMKQYTEDM DQKSPGNKGS LVYAGIKSIV KSSLGMVESS RHNWSGLDKQ   480
SDIQNLNEER ILALQLCGWI KKGTDVDVGP FLNSLVQEGE WERAAAVALF NLDIRRAIQI   540
LNEGASSEKG RRSESQCGSN GFIGLYG
```

SEQ ID NO:61 PDG3 DNA SEQUENCE

Nucleic Acid Accession #: U42359
Coding sequence: 563-775 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
TTGTACATCT TAACAACCTT AAGCTGTACA AATAGANCAA TAATATCTAA ATGGTGTGAT    60
GATCAGCCCA CAGTACACAT CATTGATGAG AATTTCACTG GTCTCAACCT TTCTCATGCT   120
GAGTCCTGGC TTTGTAAAAT GACTTATAAA GGTCCAAGGA TTTAGAGATG ATTAAGAGAT   180
AAGCTGGCAT TCTGTAAAGG CACCATCGTC TATCCCCTGT CTTATCTAGA TAAAGAATGT   240
AGTGCTAAAT CTTGTAATAA TATTGTACAA ATGGAAATTC AATCTTAAGG ATTATTTTTT   300
CCATATTGTT GTATTTCATT GTGGTGTATT GGAAAGTGAT CTGGACTTTG AGTGAGAAGA   360
TGTGATTTGG ACCATGGCAC TTAAAAACTC TATAACCTCA GGCAAGTCTT TTAATCTTCT   420
CTGAGCCTCA GTTTTCCTCA TTTTTCAAAT ATAGAGAGTA TAACATTTAT CTCATAAGAC   480
AAGTTGTAGT AAATTACTGT TTTACAAATG TAAGATAACT TTTAACTGTG AGATTCCATA   540
TTCCAGTCTT ACATTATTAT GTTTATCTGC CACAGGGAGA AGTCCTCAGA TAAAAATGTC   600
TACCAAAAGA CTGACACGTG GAGTTAATCA TTTGACAGAT GCAAATGCTT CCACCCCCAA   660
CAAATATACT TTCTTTAACT TCTGTGTGGG TATCACTTAG GGAAAAAAAG GCAGGCAACA   720
AAATATTTTT TAATTCTATC TTAGGAAAAA TTGTAGNCAA ATCTTTTTNT CCCATTAACA   780
AATAATGTAA GCCTTAATAT TCAAGGGGTA ATAAAAATAC AAAGTCTTCC AAACAGGTAA   840
CTTACTTGAA AACTTT
```

SEQ ID NO:62 PDG3 Protein sequence
Protein Accession #: AAB18375

```
1          11         21         31         41         51
|          |          |          |          |          |
MGARGAPSRR RQAGRRLRYL PTGSFPFLLL LLLLCIQLGG GQKKKENLLA EKVEQLMEWS    60
SRRSIFRMNG DKFRKFIKAP PRNYSMIVMF TALQPQRQCS VCRQANEEYQ ILANSWRYSS   120
AFCNKLFFSM VDYDEGTDVF QQLNMNSAPT FXHXPPKGRP KRADTFDLQR IGFAAEQLAK   180
WIADRTDVHI RVFRPPNYSG TIALALLVSL VGGLLYXRRN NLEFIYNKTG WAMVSLCIVF   240
AMTSGQMWNH IRGPPYAHKN PHNGQVSYIH GSSQAQFVAE SHIILVLNAA ITMGMVLLNE   300
AATSKGDVGK RRIICLVGLG LVVFFFSFLL SIFRSKYHGY PYSDLDFE
```

SEQ ID NO:63 PDG8 DNA SEQUENCE

Nucleic Acid Accession #: AL080235
Coding sequence: 245-453 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
GGTCGCCGCA CCGGCCGCCT CCGGCCCGCC GCCGCCCCCA GCGCCGCCGC CGCCACCGCC    60
GGGGCGCCCA CCGCGCTGCC AGCCTACCCC GCGGCCGAGC CGCCCGGGCC GCTGTGGCTG   120
CAGGGCGAGC CGCTGCATTT CTGCTGCCTA GACTTCAGCC TGGAGGAGCT GCAGGGCGAG   180
CCGGGCTGGC GGCTGAACCG TAAGCCCATT GAGTCCACGC TGGTGGCCTG CTTCATGACC   240
CTGGTCATCG TGGTGTGGAG CGTGGCCGCC CTCATCTGGC CGGTGCCCAT CATCGCCGGC   300
TTCCTGCCCA ACGGCATGGA ACAGCGCCGG ACCACCGCCA GCACCACCGC AGCCACCCCC   360
GCCGCAGTGC CCGCAGGGAC CACCGCAGCC GCCGCCGCCG CCGCCGCTGC CGCCGCCGCC   420
GCGGCCGTCA CTTCGGGGGT GGCGACCAAG TGACCCGCTC CGCTCCTCCC TGTGTCCGTC   480
CTGTGTCCGC GCGCGCGGGT GCCTTTCCCG CCGGGGACTC GGCCGGTGTG CTTCGTGCTG   540
TAGTTATCGT TAGTTCCTCT TCCCGAGATG GGGCCGCCGA GAGACCCCAG CGCCTTTGAA   600
AAGCAAGGTT TGTGCTGCGC TTCCAGTTCC GAAAAGCAGA TGTTTAAGCC CTTGGACTGA   660
GGGTGGGATC GCAGCTCCGA AGACGGAGAG GAGGGAAATG GGGCCCTTTC CCCTCTATTG   720
CATCCCCCTG CCCGACTCCT TCCCCGCACC CACGTGCCCT AGATTCATGG CAGAAAATGA   780
CCAAATCCTG TGTATTTGTT TTATATATTT AATAACTGTT TTAAATGAAA GTTTTAGTAA   840
AAAAAATACA AAACAAAAAG ATTAAATTGC TATTGCTGTA GTAAGAGAAG CTCTTTGTAT   900
CTGAACATAG TTGTATTTGA AATTTGTGGT TTTTTAATTT ATTTAAAATT GGGGGGAGGG   960
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CATGGGAAGG ATTTAACACC GATATATTGT TACCGCTGAA AATGAACTTT ATGAACCTTT  1020
TCCAAGTTGA TCTATCCAGT GACGTGGCCT GGTGGGCGTT TCTTCTTGTA CTTATGTGGT  1080
TTTTTGGCTT TTAATACAGA CATTTTCCTC CAAAAAAAAA AAAAAAAAGG
```

SEQ ID NO:64 PDG8 Protein sequence
Protein Accession #: CAB45781

```
1          11         21         31         41         51
|          |          |          |          |          |
GRRTGRLRPA AAPSAAAATA GAPTALPAYP AAEPPGPLWL QGEPLHFCCL DFSLEELQGE    60
PGWRLNRKPI ESTLVACFMT LVIVVWSVAA LIWPVPIIAG FLPNGMEQRR TTASTTAATP   120
AAVPAGTTAA AAAAAAAAA AAVTSGVATK
```

SEQ ID NO:65 PDM1 DNA SEQUENCE

Nucleic Acid Accession #: NM_006765
Coding sequence: 149-1195 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
CGGCCGCGGC CCGGGTCCCT CGCAAAGCCG CTGCCATCCC GGAGGGCCCA GCCAGCGGGC    60
TCCCGGAGGC TGGCCGGGCA GGCGTGGTGC GCGGTAGGAG CTGGGCGCGC ACGGCTACCG   120
CGCGTGGAGG AGACACTGCC CTGCCGCGAT GGGGGCCCGG GGCGCTCCTT CACGCCGTAG   180
GCAAGCGGGG CGGCGGCTGC GGTACCTGCC CACCGGGAGC TTTCCCTTCC TTCTCCTGCT   240
GCTGCTGCTC TGCATCCAGC TCGGGGGAGG ACAGAAGAAA AAGGAGAATC TTTTAGCTGA   300
AAAAGTAGAG CAGCTGATGG AATGGAGTTC CAGACGCTCA ATCTTCCGAA TGAATGGTGA   360
TAAATTCCGA AAATTTATAA AGGCACCACC TCGAAACTAT TCCATGATTG TTATGTTCAC   420
TGCTCTTCAG CCTCAGCGGC AGTGTTCTGT GTGCAGGCAA GCTAATGAAG AATATCAAAT   480
ACTGGCGAAC TCCTGGCGCT ATTCATCTGC TTTTTGTAAC AAGCTCTTCT TCAGTATGGT   540
GGACTATGAT GAGGGGACAG ACGTTTTTCA GCAGCTCAAC ATGAACTCTG CTCCTACATT   600
CAYGCATTTW CCTCCAAAAG GCAGACCTAA GAGAGCTGAT ACTTTTGACC TCCAAAGAAT   660
TGGATTTGCA GCTGAGCAAC TAGCAAAGTG GATTGCTGAC AGAACGGATG TTCATATTCG   720
GGTTTTCAGA CCACCCAACT ACTCTGGTAC CATTGCTTTG GCCCTGTTAG TGTCGCTTGT   780
TGGAGGTTTG CTTTATTNGA GAAGGAACAA CTTGGAGTTC ATCTATAACA AGACTGGTTG   840
GGCCATGGTG TCTCTGTGTA TAGTCTTTGC TATGACTTCT GGCCAGATGT GGAACCATAT   900
CCGTGGACCT CCATATGCTC ATAAGAACCC ACACAATGGA CAAGTGAGCT ACATTCATGG   960
GAGCAGCCAG GCTCAGTTTG TGGCAGAATC ACACATTATT CTGGTACTGA ATGCCGCTAT  1020
CACCATGGGG ATGGTTCTTC TAAATGAAGC AGCAACTTCG AAAGGCGATG TTGGAAAAAG  1080
ACGGATAATT TGCCTAGTGG GATTGGGCCT GGTGGTCTTC TTCTTCAGTT TTCTACTTTC  1140
AATATTTCGT TCCAAGTACC ACGGCTATCC TTATAGTGAT CTGGACTTTG AGTGAGAAGA  1200
TGTGATTTGG ACCATGGCAC TTAAAAACTC TATAACCTCA GCTTTTTAAT TAAATGAAGC  1260
CAAGTGGGAT TTGCATAAAG TGAATGTTTA CCATGAAGAT AAACTGTTCC TGACTTTATA  1320
CTATTTTGAA TTCATTCATT TCATTGTGAT CAGCTAGCTT ATTCTTGTGT ACTTTTTTTA  1380
AACTGTGGGT TTTCCTAGTA AATTTAATTT ACAGAAATCA ATGGTAGCAT TTAGTAATCT  1440
ACAAAGGAAA TATCAAAGTG TTTTTCAAGC CTGTTATATY CAGTGTGTKC CACAGGATTG  1500
CAATAAATGA CAATGTAATT A
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SEQ ID NO:66 PDM1 Protein sequence:
Protein Accession #: NP_006756

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1          11         21         31         41         51
|          |          |          |          |          |
MGARGAPSRR RQAGRRLRYL PTGSFPFLLL LLLLCIQLGG GQKKKENLLA EKVEQLMEWS    60
SRRSIFRMNG DKFRKFIKAP PRNYSMIVMF TALQPQRQCS VCRQANEEYQ ILANSWRYSS   120
AFCNKLFFSM VDYDEGTDVF QQLNMNSAPT FXHXPPKGRP KRADTFDLQR IGFAAEQLAK   180
WIADRTDVHI RVFRPPNYSG TIALALLVSL VGGLLYXRRN NLEFIYNKTG WAMVSLCIVF   240
AMTSGQMWNH IRGPPYAHKN PHNGQVSYIH GSSQAQFVAE SHIILVLNAA ITMGMVLLNE   300
AATSKGDVGK RRIICLVGLG LVVFFFSFLL SIFRSKYHGY PYSDLDFE
```

SEQ ID NO:67 PDM2 DNA SEQUENCE

Nucleic Acid Accession #: NM_000947
Coding sequence: 88-1617 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
GGTTTCATAT GAACTCTCCC GCCACCCGGG AACAGCTGGC TGCCACCGTT TGTGTTTTCC    60
GAGTTTGTAT TCTTGCAGGT GACCAAGATG GAGTTTTCTG GAAGAAAGCG GAGGAAGCTG   120
AGGTTGGCAG GTGACCAGAG GAATGCTTCC TACCCTCATT GCCTTCAGTT TTACTTGCAG   180
CCACCTTCTG AAAACATATC TTTAACAGAA TTTGAAAACT TGGCTATTGA TAGAGTTAAA   240
TTGTTAAAAT CAGTTGAAAA TCTTGGAGTG AGCTATGTGA AAGGAACTGA ACAATACCAG   300
AGTAAGTTGG AGAGTGAGCT TCGGAAGCTC AAGTTTTCCT ACAGAGAGAA GCTAGAAGAT   360
GAATATGAAC CACGAAGAAG AGATCATATT TCTCATTTTA TTTTGCGGCT TGCTTATTGC   420
CAGTCTGAAG AACTTAGACG CTGGTTCATT CAACAAGAAA TGGATCTCCT TCGATTTAGA   480
TTTAGTATTT TACCCAAGGA TAAAATTCAG GATTTCTTAA AGGATAGCCA ATTGCAGTTT   540
GAGGCTATAA GTGATGAAGA GAAGACTCTT CGAGAACAGG AGATTGTTGC CTCATCACCA   600
AGTTTAAGTG GACTTAAGTT GGGGTTCGAG TCCATTTATA AGATCCCTTT TGCTGATGCT   660
CTGGATTTGT TTCGAGGAAG GAAAGTCTAT TTGGAAGATG GCTTTGCTTA CGTACCACTT   720
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AAGGACATTG TGGCAATCAT CCTGAATGAA TTTAGAGCCA AACTGTCCAA GGCTTTGGCA   780
TTAACAGCCA GGTCCTTGCC TGCTGTGCAG TCTGATGAAA GACTTCAGCC TCTGCTCAAT   840
CACCTCAGTC ATTCCTACAC TGGCCAAGAT TACAGTACCC AGGGAAATGT TGGGAAGATT   900
TCTTTAGATC AGATTGATTT GCTTTCTACC AAATCCTTCC CACCTTGCAT GCGTCAGTTA   960
CATAAAGCCT TGCGGGAAAA TCACCATCTT CGTCATGGAG GCCGAATGCA GTATGGCCTA  1020
TTTCTGAAGG GCATTGGTTT AACTTTGGAA CAGGCATTGC AGTTCTGGAA GCAAGAATTT  1080
ATCAAAGGAA AGATGGATCC AGACAAGTTT GATAAAGGTT ACTCTTACAA CATCCGTCAC  1140
AGCTTTGGAA AGGAAGGCAA GAGGACAGAC TATACACCTT TCAGTTGCCT GAAGATTATT  1200
CTGTCCAATC CACCAAGCCA AGGGGATTAT CATGGGTGCC CATTCCGTCA CAGTGATCCA  1260
GAGCTGCTGA AGCAAAAGTT GCAGTCATAC AAGATCTCTC CTGGAGGGAT AAGCCAGATT  1320
TTGGATTTAG TAAAGGGGAC ACATTACCAG GTAGCCTGTC AAAAATACTT TGAGATGATA  1380
CACAATGTGG ATGATTGTGG CTTTTCTTTG AATCATCCTA ATCAGTTCTT TTGTGAGAGC  1440
CAACGTATTC TAAATGGTGG TAAAGACATA AAGAAGGAAC CTATCCAACC AGAAACTCCT  1500
CAACCCAAAC CAAGTGTCCA GAAAACCAAG GATGCATCAT CTGCTCTGGC CTCTTTAAAT  1560
TCCTCTCTGG AAATGGATAT GGAAGGACTA GAAGATTACT TTAGTGAAGA TTCTTAGGCA  1620
GTTTTATAAC CCTTTTTCCT CAATAGCCTG TTTCCTGTTT TTAAGATTTT GCCTTTGTTG  1680
TTGAAAAAGG GTTTCACTGT CACCAAGGCT TAGTGCAGTG ACACAATTAC AGCTGATTGC  1740
AGCCTTGACC TTCCCAGCTC AAGTGATCCT CCTACCTCAG CCTCCCAAGT AGTTAGGACA  1800
CACAGGTGTG CACCTCATAT CCAGATAATT TTTTTCAATT TTTTTTTGTA GAGGTGGGGG  1860
GTCTCCCTAT GTTGCCCAGG CAGATCTCAG ACTCCTGGGC TCAAGCGATC CTCACACCTC  1920
AGCGTCCCAG AGTGCTGGGA TTACAGTTGT GAGCCACTGT GCCTGGCCTT TTTTTTTTTT  1980
TAACCTTTTC GTTTAACTTC TCTCTTCACT GCATCCCAAT CCATCTACAG GCATGCACAC  2040
TTATTAGGAA AGGAGGTTTG AGGTAACAAC AGAGACTTTC ACTATATTTT GCTTTGACAG  2100
AAGGAAAGAG GAGGAGTTTC TATTAAAATC TGTCACTTGA GTGATGTCAT TTAAGTCCTA  2160
TTTTAGGAGA TAAAAACAGC TTTGGGGACT GGTTAAAGTC CCCCAGAAAC TACAATAAAG  2220
AACAACTTTT GTTTTAACTC TTAATCACTT TGTAATTTTG ACTCAATCCT TTTCTGGACC  2280
ATTTTTGTTA ATAAATATCA AAGTGT
```

<u>SEQ ID NO:68 PDM2 Protein sequence:</u>
Protein Accession #: NP_000938

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1          11         21         31         41         51
|          |          |          |          |          |
MEFSGRKRRK LRLAGDQRNA SYPHCLQFYL QPPSENISLT EFENLAIDRV KLLKSVENLG    60
VSYVKGTEQY QSKLESELRK LKFSYREKLE DEYEPRRRDH ISHFILRLAY CQSEELRRWF   120
IQQEMDLLRF RFSILPKDKI QDFLKDSQLQ FEAISDEEKT LREQEIVASS PSLSGLKLGF   180
ESIYKIPFAD ALDLFRGRKV YLEDGFAYVP LKDIVAIILN EFRAKLSKAL ALTARSLPAV   240
QSDERLQPLL NHLSHSYTGQ DYSTQGNVGK ISLDQIDLLS TKSFPPCMRQ LHKALRENHH   300
LRHGGRMQYG LFLKGIGLTL EQALQFWKQE FIKGKMDPDK FDKGYSYNIR HSFGKEGKRT   360
DYTPFSCLKI ILSNPPSQGD YHGCPFRHSD PELLKQKLQS YKISPGGISQ ILDLVKGTHY   420
QVACQKYFEM IHNVDDCGFS LNHPNQFFCE SQRILNGGKD IKKEPIQPET PQPKPSVQKT   480
KDASSALASL NSSLEMDMEG LEDYFSEDS
```

SEQ ID NO:69 PDM3 DNA SEQUENCE

Nucleic Acid Accession #: NM_024840
Coding sequence: 108-491 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
AATTCATACA GGAGAGAAGT CATATATATG CAGTGATTGT GGAAAAGGCT TCATCAAGAA    60
GTCTCGGCTC ATTAATCATC AGAGAGTTCA TACAGGAGAG AAACCACATG GATGCAGCCT   120
GTGTGGGAAG GCCTTCTCCA AAAGGTCCAG GCTCACTGAA CACCAGAGAA CTCATACAGG   180
AGAGAAGCCC TATGAATGCA CTGAATGTGA CAAAGCATTC CGCTGGAAAT CACAGCTCAA   240
TGCACATCAG AAAGCTCACA CAGGAGAGAA GTCATATATA TGCCGTGATT GTGGAAAAGG   300
CTTCATTCAG AAGGGAAATC TCATTGTACA TCAGCGAATT CATACTGGAG AAAAACCCTA   360
TATATGCAAT GAATGTGGAA AAGGCTTCAT CCAAAAGGGC AACCTCCTTA TTCATCGACG   420
TACTCACACT GGAGAGAAAC CCTATGAATG CAATGAATGT GGGAAAGGCT TCAGCCAGAA   480
GACATGTTTA ATATCCCATC AGAGATTTCA CACAGGAAAG ACACCCTTTG TATGTACTGA   540
GTGTGGAAAA TCCTGCTCAC ACAAGTCAGG TCTCATTAAC CACCAGAGAA TTCACACAGG   600
AGAGAAACCC TATACATGCA GTGACTGTGG GAAAGCTTTC AGAGATAAAT CATGTCTCAA   660
CAGACATCGG AGAACTCATA CAGGGGAGAG ACCGTATGGA TGCTCTGATT GTGGGAAAGC   720
TTTCTCCCAC TTGTCATGCC TTGTTTATCA TAAGGGAATG CTGCATGCAA GAGAGAAATG   780
TGTAGGTTCA GTCAAATTGG AAAATCCTTG CTCAGAGAGT CATAGCTTAT CACATACACG   840
TGATCTCATA CAGGATAAAG ACTCTGTTAA CATGGTGACT CTGCAGATGC CTTCTGTGGC   900
AGCTCAGACC TCATTAACTA ACAGTGCGTT CCAAGCAGAG AGCAAAGTAG CCATTGTGAG   960
CCAGCCTGTT GCCAGAAGTT CAGTCTCAGC AGATAGTAGA ATTTGCACAG AATAAAAACC  1020
ATATGAATGC AGTGAATGTG GTAGTGCTTT CAGTGATCAA TTACATCATA TGTCACAAAA  1080
AACACAGAGG AACAAACTGA TATATTCAAG GTGGAAAGCC CTTGAATAAA ACCTTATGGC  1140
TAATAAGCAT ATACTCAGAG AAAAATAGTA TGAAGTGGAG ACTGGGAAAT TCTTTTATGG  1200
GAAGATAGAT CTTCTCATCA GTGACCATAG ATCACATCTT CAGTGAGCTT ATAGTTGGTA  1260
GAAATATAAT GATCATGGAA AAGTCCTTGT TCAGAAACAG TACGCCAGTA GGTATCAGGG  1320
GGTTTACACA GGAGAGAAAC TTTTGGAAGA CCTTTGAAGG CTATGAATGT GGCAGGGTTG  1380
CTAGTGGTAC ATTCTGCCTT ATCCTCAGAG GGAATCATAT AGAAATAAAA CTATGAAAAT  1440
GTAACTAGAA CATCTTCATC AAAATATGAA AGAACACACG AAGCAAATAA GCCCTGTGAA  1500
AAGGAGTATT TTAGAGATTT CGATCAGAAA TCTAACATCA TTATATGGCA GATAATATAC  1560
AGGATGTGTA TTTTAGGACA ATATACCTTG AATCACTAGT TGATATGTCA ATGACTAATT  1620
AAAAGGGGTT GTCAGTGTTA CACATCATTG GTTAAATTTA TAGCACAATG TACCTCTTCC  1680
CCCTTTTTTG ATAAGAGTCT TCTATTCCCA ACCAAGATCA TTATATGATT AGCTCTTGTG  1740
TTTCTTTGAT TCCAAATTTC TTCACTTGTT ATTTCAGACT ACTGAAGCTC TTCAAAAGGA  1800
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AAAATGTATT TAATTTAATA ATGTAACACA ACAAGTTTGG ATGTGTTTAA CTTTATAAAT  1860
AATCACCCCA GAGGAATGAA GTTCAAAACT TGTGAATAAC C
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SEQ ID NO:70 PDM3 Protein sequence:
Protein Accession #: NP_079116

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1          11         21         31         41         51
|          |          |          |          |          |
MDAACVGRPS PKGPGSLNTR ELIQERSPMN ALNVTKHSAG NHSSMHIRKL TQERSHIYAV    60
IVEKASFRRE ISLYISEFIL EKNPIYAMNV EKASSKRATS LFIDVLTLER NPMNAMNVGK   120
ASARRHV
```

SEQ ID NO:71 PDM8 DNA SEQUENCE

Nucleic Acid Accession #: NM_018455
Coding sequence: 341-955 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
AATTTCGGCA CGGGGGGGAG GCACAGTGAG TCCACTGGGG CACGGCAGCG TCTAAGCCAC    60
AAGCCGACTG ACATAAGCCA GGTCCTAACG GAGCCTATGT GTAAGTCCAC TACTGGTGCA   120
AGGTTGCACA CTTCTAAGAA GAGCGGCGTG GGGGGCTCGG CGACCTTCGC TTCAGTCGCT   180
CCCCCGTGCA GTCCCCTGTG CCCAAGACAC AGCCTGATGC TTGTGCTCCG GTGGGCGGAC   240
TTGGAGGCGG CGGGAACTGC AATTGGTGGC TTTGAAGGGC GGCGAGCGGG AACAGCTCTT   300
GAGGAGTGAG ACTGCAGGAG ATGTGGGCCG TGCCAAAGAG ATGGATGAGA CTGTTGCTGA   360
GTTCATCAAG AGGACCATCT TGAAAATCCC CATGAATGAA CTGACAACAA TCCTGAAGGC   420
CTGGGATTTT TTGTCTGAAA ATCAACTGCA GACTGTAAAT TTCCGACAGA GAAAGGAATC   480
TGTAGTTCAG CACTTGATCC ATCTGTGTGA GGAAAAGCGT GCAAGTATCA GTGATGCTGC   540
CCTGTTAGAC ATCATTTATA TGCAATTTCA TCAGCACCAG AAAGTTTGGG ATGTTTTTCA   600
GATGAGTAAA GGACCAGGTG AAGATGTTGA CCTTTTTGAT ATGAAACAAT TTAAAAATTC   660
GTTCAAGAAA ATTCTTCAGA GAGCATTAAA AAATGTGACA GTCAGCTTCA GAGAAACTGA   720
GGAGAATGCA GTCTGGATTC GAATTGCCTG GGGAACACAG TACACAAAGC CAAACCAGTA   780
CAAACCTACC TACGTGGTGT ACTACTCCCA GACTCCGTAC GCCTTCACGT CCTCCTCCAT   840
GCTGAGGCGC AATACACCGC TTCTGGGTCA GGAGTTAGAA GCTACTGGGA AAATCTACCT   900
CCGACAAGAG GAGATCATTT TAGATATTAC CGAAATGAAG AAAGCTTGCA ATTAGTGAAC   960
ATGAAAGGAA AATAAAAATT CCTCACAGTC AAAAAAAAAA AAAAA
```

SEQ ID NO:72 PDM8 Protein sequence:
Protein Accession #: NP_060925

```
1          11         21         31         41         51
|          |          |          |          |          |
MDETVAEFIK RTILKIPMNE LTTILKAWDF LSENQLQTVN FRQRKESVVQ HLIHLCEEKR    60
ASISDAALLD IIYMQFHQHQ KVWDVFQMSK GPGEDVDLFD MKQFKNSFKK ILQRALKNVT   120
VSFRETEENA VWIRIAWGTQ YTKPNQYKPT YVVYYSQTPY AFTSSSMLRR NTPLLGQELE   180
ATGKIYLRQE EIILDITEMK KACN
```

SEQ ID NO:73 PDM9 DNA SEQUENCE

Nucleic Acid Accession #: NM_016192
Coding sequence: 1-1125 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
ATGGTGCTGT GGGAGTCCCC GCGGCAGTGC AGCAGCTGGA CACTTTGCGA GGGCTTTTGC    60
TGGCTGCTGC TGCTGCCCGT CATGCTACTC ATCGTAGCCC GCCCGGTGAA GCTCGCTGCT   120
TTCCCTACCT CCTTAAGTGA CTGCCAAACG CCCACCGGCT GGAATTGCTC TGGTTATGAT   180
GACAGAGAAA ATGATCTCTT CCTCTGTGAC ACCAACACCT GTAAATTTGA TGGGGAATGT   240
TTAAGAATTG GAGACACTGT GACTTGCGTC TGTCAGTTCA AGTGCAACAA TGACTATGTG   300
CCTGTGTGTG GCTCCAATGG GGAGAGCTAC CAGAATGAGT GTTACCTGCG ACAGGCTGCA   360
TGCAAACAGC AGAGTGAGAT ACTTGTGGTG TCAGAAGGAT CATGTGCCAC AGATGCAGGA   420
TCAGGATCTG GAGATGGAGT CCATGAAGGC TCTGGAGAAA CTAGTCAAAA GGAGACATCC   480
ACCTGTGATA TTTGCCAGTT TGGTGCAGAA TGTGACGAAG ATGCCGAGGA TGTCTGGTGT   540
GTGTGTAATA TTGACTGTTC TCAAACCAAC TTCAATCCCC TCTGCGCTTC TGATGGGAAA   600
TCTTATGATA ATGCATGCCA AATCAAAGAA GCATCGTGTC AGAAACAGGA GAAAATTGAA   660
GTCATGTCTT TGGGTCGATG TCAAGATAAC ACAACTACAA CTACTAAGTC TGAAGATGGG   720
CATTATGCAA GAACAGATTA TGCAGAGAAT GCTAACAAAT TAGAAGAAAG TGCCAGAGAA   780
CACCACATAC CTTGTCCGGA ACATTACAAT GGCTTCTGCA TGCATGGGAA GTGTGAGCAT   840
TCTATCAATA TGCAGGAGCC ATCTTGCAGG TGTGATGCTG GTTATACTGG ACAACACTGT   900
GAAAAAAAGG ACTACAGTGT TCTATACGTT GTTCCCGGTC CTGTACGATT TCAGTATGTC   960
TTAATCGCAG CTGTGATTGG AACAATTCAG ATTGCTGTCA TCTGTGTGGT GGTCCTCTGC  1020
ATCACAAGGA AATGCCCCAG AAGCAACAGA ATTCACAGAC AGAAGCAAAA TACAGGGCAC  1080
TACAGTTCAG ACAATACAAC AAGAGCGTCC ACGAGGTTAA TCTGA
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SEQ ID NO:74 PDM9 Protein sequence:
Protein Accession #: NP_057276

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      1          11         21         31         41         51
      |          |          |          |          |          |
    1 MVLWESPRQC SSWTLCEGFC WLLLLPVMLL IVARPVKLAA FPTSLSDCQT PTGWNCSGYD     60
   61 DRENDLFLCD TNTCKFDGEC LRIGDTVTCV CQFKCNNDYV PVCGSNGESY QNECYLRQAA    120
  121 CKQQSEILVV SEGSCATDAG SGSGDGVHEG SGETSQKETS TCDICQFGAE CDEDAEDVWC    180
  181 VCNIDCSQTN FNPLCASDGK SYDNACQIKE ASCQKQEKIE VMSLGRCQDN TTTTTKSEDG    240
  241 HYARTDYAEN ANKLEESARE HHIPCPEHYN GFCMHGKCEH SINMQEPSCR CDAGYTGQHC    300
  301 EKKDYSVLYV VPGPVRFQYV LIAAVIGTIQ IAVICVVVLC ITRKCPRSNR IHRQKQNTGH    360
  361 YSSDNTTRAS TRLI
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SEQ ID NO:75 PDO1 DNA SEQUENCE

Nucleic Acid Accession #: NM_014324
Coding sequence: 89-1237 (underlined sequences correspond to start and stop codons)

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GGCGCCGGGA TTGGGAGGGC TTCTTGCAGG CTGCTGGGCT GGGGCTAAGG GCTGCTCAGT     60
TTCCTTCAGC GGGGCACTGG GAAGCGCCAT GGCACTGCAG GGCATCTCGG TCGTGGAGCT    120
GTCCGGCCTG GCCCCGGGCC GTNTCTGTGC TATGGTCCTG GCTGACTTCG GGGCGCGTGT    180
GGTACGCGTG GACCGGCCCG GCTCCCGCTA CGACGTGAGC CGCTTGGGCC GGGGCAAGCG    240
CTCGCTAGTG CTGGACCTGA AGCAGCCGCG GGAGCCGCGT GCTGCGGCGT CTGTGCAAGC    300
GGTCGGATGT GCTGCTGGAG CCCTTCCGCC GCGGTGTCAT GGAGAAACTC CAGCTGGGCC    360
CAGAGATTCT GCAGCGGGAA AATCCAAGGC TTATTTATGC CAGGCTGAGT GGATTTGGCC    420
AGTTCAGGAA AGCTTCTGCC GGTTAGCTGG CCACGATATC AACTATTTGG CTTTGTCAGG    480
TGTTCTCTCA AAAATTGGCA GAAGTGGTGA GAATCCGTAT GCCCCGCTGA ATCTCGTGGC    540
TGACTTTGCT GGTGGTGGCC TTATGTGTGC ACTGGGCATT ATAATGGCTC TTTTTGACCG    600
CACACGCACT GACAAGGGTC AGGTCATTGA TGCAAATATG GTGGAAGGAA CAGCATATTT    660
AAGTTCTTTT CTGTGGAAAA CTCAGAAATC GAGTCTGTGG GAAGCACCTC GAGGACAGAA    720
CATGTTGGAT GGTGGAGCAC CTTTCTATAC GACTTACAGG ACAGCAGATG GGGAATTCAT    780
GGCTGTTGGA GCAATAGAAC CCCAGTTCTA CGAGCTGCTG ATCAAAGGAC TTGGACTAAA    840
GTCTGATGAA CTTCCCAATC AGATGAGCAC GGATGATTGG CCAGAAATGA AGAAGAAGTT    900
TGCAGATGTA TTTGCAAAGA AGACGAAGGC AGAGTGGTGT CAAATCTTTG ACGGCACAGA    960
TGCCTGTGTG ACTCCGGTTC TGACTTTTGA GGAGGTTGTT CATCATGATC ACAACAAGGA   1020
ACGGGGCTCG TTTATCACCA GTGAGGAGCA GGACGTGAGC CCCCGCCTTG CACCTCTGCT   1080
GTTAAACACC CCAGCCATCC CTTCTTCCAA AGGGGATCCT TTCATAGGAG AACACACTGA   1140
GGAGATACTT GAAGAATTTG GATTCAGCCG AGAAGAGATT TATCAGCTTA ACTCAGATAA   1200
AATCATTGAA AGTAATAAGG TAAAAGCTAG TCTCTAACTT CCAGGCCCAC GGCTCAAGTG   1260
AATTTGAATA CTGCATTTAC AGTGTAGAGT AACACATAAC ATTGTATGCA TGGAAACATG   1320
GAGGAACAGT ATTACAGTGT CCTACCACTC TAATCAAGAA AAGAATTACA GACTCTGATT   1380
CTACAGTGAT GATTGAATTC TAAAAATGGT TATCATTAGG GCTTTTGATT TATAAAACTT   1440
TGGGTACTTA TACTAAATTA TGGTAGTTAT TCTGCCTTCC AGTTTGCTTG ATATATTTGT   1500
TGATATTAAG ATTCTTGACT TATATTTTGA ATGGGTTCTA GTGAAAAAGG AATGATATAT   1560
TCTTGAAGAC ATCGATATAC ATTTATTTAC ACTCTTGATT CTACAATGTA GAAAATGAGG   1620
AAATGCCACA AATTGTATGG TGATAAAAGT CACGTGAAAC AGAGTGATTG GTTGCATCCA   1680
GGCCTTTTGT CTTGGTGTTC ATGATCTCCC TCTAAGCACA TTCCAAACTT TAGCAACAGT   1740
TATCACACTT TGTAATTTGC AAAGAAAAGT TTCACCTGTA TTGAATCAGA ATGCCTTCAA   1800
CTGAAAAAAA CATATCCAAA ATAATGAGGA AATGTGTTGG CTCACTACGT AGAGTCCAGA   1860
GGGACAGTCA GTTTTAGGGT TGCCTGTATC CAGTAACTCG GGGCCTGTTT CCCCGTGGGT   1920
CTCTGGGCTG TCAGCTTTCC TTTCTCCATG TGTTTGATTT CTCCTCAGGC TGGTAGCAAG   1980
TTCTGGATCT TATACCCAAC ACACAGCAAC ATCCAGAAAT AAAGATCTCA GGACCCCCCA   2040
AAAAAAAAAA AAAAAAAAAA AAAAAAAA
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SEQ ID NO:76 PDO1 Protein sequence:
Protein Accession #: NP_055139

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      1          11         21         31         41         51
      |          |          |          |          |          |
    1 MALQGISVVE LSGLAPGRXC AMVLADFGAR VVRVDRPGSR YDVSRLGRGK RSLVLDLKQP     60
   61 REPRAAASVQ AVGCAAGALP PRCHGETPAG PRDSAAGKSK AYLCQAEWIW PVQESFCRLA    120
  121 GHDINYLALS GVLSKIGRSG ENPYAPLNLV ADFAGGGLMC ALGIIMALFD RTRTDKGQVI    180
  181 DANMVEGTAY LSSPLWKTQK SSLWEAPRGQ NMLDGGAPFY TTYRTADGEF MAVGAIEPQF    240
  241 YELLIKGLGL KSDELPNQMS TDDWPEMKKK FADVFAKKTK AEWCQIFDGT DACVTPVLTF    300
  301 EEVVHHDHNK ERGSFITSEE QDVSPRLAPL LLNTPAIPSS KGDPFIGEHT EEILEEFGFS    360
  361 REEIYQLNSD KIIESNKVKA SL
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SEQ ID NO:77 PDO3 DNA SEQUENCE

Nucleic Acid Accession #: AB028951
Coding sequence: 97-1128 (underlined sequences correspond to start and stop codons)

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CTTCACAGAG ACTTGAAACC AGCAAATATC CTAGTAATGG GAGAAGGTCC TGAGAGGGGG    120
AGAGTCAAAA TAGCTGACAT GGGTTTTGCC AGATTATTCA ATTCTCCTCT AAAGCCACTA    180
GCAGATTTGG ATCCAGTAGT TGTGACATTT TGGTATCGGG CTCCAGAACT TTTGCTTGGT    240
GCAAGGCATT ATACAAAGGC CATTGATATA TGGGCAATAG GTTGTATATT TGCTGAATTG    300
TTGACTTCGG AACCTATTTT TCACTGTCGT CAGGAAGATA TAAAAACAAG CAATCCCTTT    360
```

CATCATGATC AACTGGATCG GATATTTAGT GTCATGGGGT TTCCTGCAGA TAAAGACTGG 420
GAAGATATTA GAAAGATGCC AGAATATCCC ACACTTCAAA AAGACTTTAG AAGAACAACG 480
TATGCCAACA GTAGCCTCAT AAAGTACATG GAGAAACACA AGGTCAAGCC TGACAGCAAA 540
GTGTTCCTCT TGCTTCAGAA ACTCCTGACC ATGGATCCAA CCAAGAGAAT TACCTCGGAG 600
CAAGCTCTGC AGGATCCCTA TTTTCAGGAG GACCCTTTGC CAACATTAGA TGTATTTGCC 660
GGCTGCCAGA TTCCATACCC CAAACGAGAA TTCCTTAATG AAGATGATCC TGAAGAAAAA 720
GGTGACAAGA ATCAGCAACA GCAGCAGAAC CAGCATCAGC AGCCCACAGC CCCTCCACAG 780
CAGGCAGCAG CCCCTCCACA GGCGCCCCCA CCACAGCAGA ACAGCACCCA GACCAACGGG 840
ACCGCAGGTG GGGCTGGGGC CGGGGTCGGG GGCACCGGAG CAGGGTTGCA GCACAGCCAG 900
GACTCCAGCC TGAACCAGGT GCCTCCAAAC AAGAAGCCAC GGCTAGGGCC TTCAGGCGCA 960
AACTCAGGTG GACCTGTGAT GCCCTCGGAT TATCAGCACT CCAGTTCTCG CCTGAATTAC 1020
CAAAGCAGCG TTCAGGGATC CTCTCAGTCC CAGAGCACAC TTGGCTACTC TTCCTCGTCT 1080
CAGCAGAGCT CACAGTACCA CCCATCTCAC CAGGCCCACC GGTACTGACC AGCTCCCGTT 1140
GGGCCAGGCC AGCCCAGCCC AGAGCACAGG CTCCAGCAAT ATGTCTGCAT TGAAAAGAAC 1200
CAAAAAAATG CAAACTATGA TGCCATTTAA AACTCATACA CATGGGAGGA AAACCTTATA 1260
TACTGAGCAT TGTGCAGGAC TGATAGCTCT TCTTTATTGA CTTAAAGAAG ATTCTTGTGA 1320
AGTTTCCCCA GCACCCCTTC CCTGCATGTG TTCCATTGTG ACTTCTCTGA TAAAGCGTCT 1380
GATCTAATCC CAGCACTTCT GTAACCTTCA GCATTTCTTT GAAGGATTTC CTGGTGCACC 1440
TTTCTCATGC TGTAGCAATC ACTATGGTTT ATCTTTTCAA AGCTCTTTTA ATAGGATTTT 1500
AATGTTTTAG AAACAGGATT CCAGTGGTGT ATAGTTTTAT ACTTCATGAA CTGATTTAGC 1560
AACACAGGTA AAAATGCACC TTTTAAAGCA CTACGTTTTC ACAGACAATA ACTGTTCTGC 1620
TCATGGAAGT CTTAAACAGA AACTGTTACT GTCCCAAAGT ACTTTACTAT TACGTTCGTA 1680
TTTATCTAGT TTCAGGGAAG GTCTAATAAA AAGACAAGCG GTGGGACAGA GGGAACCTAC 1740
AACCAAAAAC TGCCTAGATC TTTGCAGTTA TGTGCTTTAT GCCACGAAGA ACTGAAGTAT 1800
GTGGTAATTT TTATAGAATC ATTCATATGG AACTGAGTTC CCAGCATCAT CTTATTCTGA 1860
ATAGCATTCA GTAATTAAGA ATTACAATTT TAACCTTCAT GTAGCTAAGT CTACCTTAAA 1920
AAGGGTTTCA AGAGCTTTGT ACAGTCTCGA TGGCCCACAC CAAAACGCTG AAGAGAGTAA 1980
CAACTGCACT AGGATTTCTG TAAGGAGTAA TTTTGATCAA AAGACGTGTT ACTTCCCTTT 2040
GAAGGAAAAG TTTTTAGTGT GTATTGTACA TAAAGTCGGC TTCTCTAAAG AACCATTGGT 2100
TTCTTCACAT CTGGGTCTGC GTGAGTAACT TTCTTGCATA ATCAAGGTTA CTCAAGTAGA 2160
AGCCTGAAAA TTAATCTGCT TTTAAAATAA AGAGCAGTGT TCTCCATTCG TATTTGTATT 2220
AGATATAGAG TGACTATTTT TAAAGCATGT TAAAAATTTA GGTTTTATTC ATGTTTAAAG 2280
TATGTATTAT GTATGCATAA TTTTGCTGTT GTTACTGAAA CTTAATTCTA TCAAGAATCT 2340
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GTTCTTCTGA ATGCTACTAG CAGCACCAGC CTTGTTTTAA ATGTTTTCTT GAGCTAGAAG 2640
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TTATCTACCT GGTTATGATA CTGTGGGTCC ATACACAAGT AAAATAAGAT TAGACAGAAG 2760
CCAGTATACA TTTTGCACTA TTGATGTGAT ACTGTAGCCA GCCAGGACCT TACTGATCTC 2820
AGCATAATAA TGCTCACTAA TAATGAAGTC TGCATAGTGA CACTCATCAA GACTGAAGAT 2880
GAAGCAGGTT ACGTGCTCCA TTGGAAGGAG TTTCTGATAG TCTCCTGCTG TTTTACCCCT 2940
TCCATTTTTT AAAATAAGAA ATTAGCAGCC CTCTGCATAA TGTAGCTGCC TATATGCAGT 3000
TTTATCCTGT GCCCTAAAGC CTCACTGTCC AGAGCTGTTG GTCATCAGAT GCTTATTGCA 3060
CCCTCACCAT GTGCCTGGTG CCCTGCTGGG TAGAGAACAC AGAGGACAGG GCATACTTCT 3120
TGTCCTTAAG GAGCTTGTGA TCTGTGACAG TAAGCCCTCC TGGGATGTCT GTGCCATGTG 3180
ATTGACTTAC AAGTGAAACT GTCTTATAAT ATGAAGGTCT TTTTGTTTAC TTCTAAACCC 3240
ACTTGGGTAG TTACTATCCC CAAATCTGTT CTGTAAATAA TATTATGGAA GGGTTTCTAT 3300
GTCAGTCTAC CTTAGAGAAA GCCAGTGATT CAATATCACA AAAGGCATTG ACGTATCTTT 3360
GAAATGTTCA CAGCAGCCTT TTAACAACAA CTGGGTGGTC CTTGTAGGCA GAACATACTC 3420
TCCTAAGTGG TTGTAGGAAA TTGCAAGGAA AATAGAAGGT CTGTTCTTGC TCTCAAGGAG 3480
GTTACCTTTA ATAAAAGAAG ACAAACCCAG ATAGATATGT AAACCAAAAT ACTATGCCCC 3540
TTAATACTTT ATAAGCAGCA TTGTTAAATA GTTCTTACGC TTATACATTC ACAGAACTAC 3600
CCTGTTTTCC TTGTATATAA TGACTTTTGC TGGCAGAACT GAAATATAAA CTGTAAGGGG 3660
ATTTCGTCAG TTGCTCCCAG TATACAATAT CCTCCAGGAC ATAGCCAGAA ATCTCCATTC 3720
CACACATGAC TGAGTTCCTA TCCCTGCACT GGTACTGGCT CTTTTCTCCT CTTTCCTTGC 3780
CTCAGGGTTC GTGCTACCCA CTGATTCCCT TTACCCTTAG TAATAATTTT GGATCATTTT 3840
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CCAAGCTGGA GTGCAGTGGC ACGATCTTGG CTCACTCCAA CCTCCACCTT CCAGGTTCAA 3960
GTGATTCTCC TGCCTCAGCC TCCCGAGTAG CTGGGACTAC GGGCACGCAC CACCACGTCT 4020
GGCTAATTTT TGTATTTTTA GTAGAGATGG GGTTTCACCC TATTGGTCAG GCTGGTCTTG 4080
AATTCCTCAC CTCAGGTCAT CCGCCTGTCT CGGCCTCCCG AAGTGCTGGG ATTATAGGTG 4140
TGAGCCACCG CACCCAGTTG GGAACAAAGC CTTTTTAACA CACGTAAGGG CCCTCAAACC 4200
GTGGGACCTC TAAGGAGACC TTTGAAGCTT TTTGAGGGCA AACTTTACCT TTGTGGTCCC 4260
CAAATGATGG CATTTCTCTT TGAAATTTAT TAGATACTGT TATGTCCCCC AAGGGTACAG 4320
GAGGGGCATC CCTCAGCCTA TGGGAACACC CAAACTAGGA GGGGTTATTG ACAGGAAGGA 4380
ATGAATCCAA GTGAAGGCTT TCTGCTCTTC GTGTTACAAA CCAGTTTCAG AGTTAGCTTT 4440
CTGGGGAGGT GTGTGTTTGT GAAAGGAATT CAAGTGTTGC AGGACAGATG AGCTCAAGGT 4500
AAGGTAGCTT TGGCAGCAGG GCTGATACTA TGAGGCTGAA ACAATCCTTG TGATGAAGTA 4560
GATCATGCAG TGACATACAA AGACCAAGGA TTATGTATAT TTTTATATCT CTGTGGTTTT 4620
GAAACTTTAG TACTTAGAAT TTTGGCCTTC TGCACTACTC TTTTGCTCTT ACGAACATAA 4680
TGGACTCTTA AGAATGGAAA GGGATGACAT TTACCTATGT GTGCTGCCTC ATTCCTGGTG 4740
AAGCAACTGC TACTTGTTCT CTATGCCTCT AAAATGATGC TGTTTTCTCT GCTAAAGGTA 4800
AAAGAAAAGA AAAAAATAGT TGGAAAATAA GACATGCAAC TTGATGTGCT TTTGAGTAAA 4860
TTTATGCAGC AGAAACTATA CAATGAAGGA AGAATTCTAT GGAAATTACA AATCCAAAAC 4920
TCTATGATGA TGTCTTCCTA GGGAGTAGAG AAAGGCAGTG AAATGGCAGT TAGACCAACA 4980
GAGGCTTGAA GGATTCAAGT ACAAGTAATA TTTTGTATAA AACATAGCAG TTTAGGTCCC 5040
CATAATCCTC AAAAATAGTC ACAAATATAA CAAAGTTCAT TGTTTTAGGG TTTTTAAAAA 5100
ACGTGTTGTA CCTAAGGCCA TACTTACTCT TCTATGCTAT CACTGCAAAG GGGTGATATG 5160

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TATGTATTAT ATAAAAAAAA AAACCCTTAA TGCACTGTTA TCTCCTAAAT ATTTAGTAAA  5220
TTAATACTAT TTAATTTTTT TAAAGATTTG TCTGTGTAGA CACTAAAAGT ATTACACAAA  5280
ATCTGGACTG AAGGTGTCCT TTTTAACAAC AATTTAAAGT ACTTTTTATA TATGTTATGT  5340
AGTATATCCT TTCTAAACTG CCTAGTTTGT ATATTCCTAT AATTCCTATT TGTGAAGTGT  5400
ACCTGTTCTT GTCTCTTTTT TCAGTCATTT TCTGCACGCA TCCCCCTTTA TATGGTTATA  5460
GAGATGACTG TAGCTTTTCG TGCTCCACTG CGAGGTTTGT GCTCAGAGCC GCTGCACCCC  5520
AGCGAGGCCT GCTCCATGGA GTGCAGGACG AGCTACTGCT TTGGAGCGAG GGTTTCCTGC  5580
TTTTGAGTTG ACCTGACTTC CTTCTTGAAA TGACTGTTAA AACTAAAATA AATTACATTG  5640
CATTTATTTT ATATTCTTGG TTGAAATAAA ATTTAATTGA CTTTG
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SEQ ID NO:78 PDO3 Protein sequence:
Protein Accession #: BAA82980

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VKSLLYQILD GIHYLHANWV LHRDLKPANI LVMGEGPERG RVKIADMGFA RLFNSPLKPL    60
ADLDPVVVTF WYRAPELLLG ARHYTKAIDI WAIGCIFAEL LTSEPIFHCR QEDIKTSNPF   120
HHDQLDRIFS VMGFPADKDW EDIRKMPEYP TLQKDFRRTT YANSSLIKYM EKHKVKPDSK   180
VFLLLQKLLT MDPTKRITSE QALQDPYFQE DPLPTLDVFA GCQIPYPKRE FLNEDDPEEK   240
GDKNQQQQQN QHQQPTAPPQ QAAAPPQAPP PQQNSTQTNG TAGGAGAGVG GTGAGLQHSQ   300
DSSLNQVPPN KKPRLGPSGA NSGGPVMPSD YQHSSSRLNY QSSVQGSSQS QSTLGYSSSS   360
QQSSQYHPSH QAHRY
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SEQ ID NO:79 PDO5 DNA SEQUENCE

Nucleic Acid Accession #: XM_002922
Coding sequence: 1-2190 (underlined sequences correspond to start and stop codons)

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ATGAATCCTT TCCAGAAAAA TGAGTCCAAG GAAACTCTTT TTTCACCTGT CTCCATTGAA    60
GAGGTACCAC CTCGACCACC TAGCCCTCCA AAGAAGCCAT CTCCGACAAT CTGTGGCTCC   120
AACTATCCAC TGAGCATTGC CTTCATTGTG GTGAATGAAT TCTGCGAGCG CTTTTCCTAT   180
TATGGAATGA AAGCTGTGCT GATCCTGTAT TTCCTGTATT TCCTGCACTG GAATGAAGAT   240
ACCTCCACAT CTATATACCA TGCCTTCAGC AGCCTCTGTT ATTTTACTCC CATCCTGGGA   300
GCAGCCATTG CTGACTCGTG GTTGGGAAAA TTCAAGACAA TCATCTATCT CTCCTTGGTG   360
TATGTGCTTG GCCATGTGAT CAAGTCCTTG GGTGCCTTAC CAATACTGGG AGGACAAGTG   420
GTACACACAG TCCTATCATT GATCGGCCTG AGTCTAATAG CTTTGGGGAC AGGAGGCATC   480
AAACCCTGTG TGGCAGCTTT TGGTGGAGAC CAGTTTGAAG AAAAACATGC AGAGGAACGG   540
ACTAGATACT TCTCAGTCTT CTACCTGTCC ATCAATGCAG GGAGCTTGAT TTCTACATTT   600
ATCACACCCA TGCTGAGAGG AGATGTGCAA TGTTTTGGAG AAGACTGCTA TGCATTGGCT   660
TTTGGAGTTC CAGGACTGCT CATGGTAATT GCACTTGTTG TGTTTGCAAT GGGAAGCAAA   720
ATATACAATA AACCACCCCC TGAAGGAAAC ATAGTGGCTC AAGTTTTCAA ATGTATCTGG   780
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CTAGACTGGG CAGCTGAGAA ATATCCAAAG CAGCTCATTA TGGATGTAAA GGCACTGACC   900
AGGGTACTAT TCCTTTATAT CCCATTGCCC ATGTTCTGGG CTCTTTTGGA TCAGCAGGGT   960
TCACGATGGA CTTTGCAAGC CATCAGGATG AATAGGAATT TGGGGTTTTT TGTGCTTCAG  1020
CCGGACCAGA TGCAGGTTCT AAATCCCTTT CTGGTTCTTA TCTTCATCCC GTTGTTTGAC  1080
TTTGTCATTT ATCGTCTGGT CTCCAAGTGT GGAATTAACT TCTCATCACT TAGGAAAATG  1140
GCTGTTGGTA TGATCCTAGC GTGCCTGGCA TTTGCAGTTG CGGCAGCTGT AGAGATAAAA  1200
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CTGGCAGATG ATGAGGTGAA GGTGACAGTG GTGGGAAATG AAAACAATTC TCTGTTGATA  1320
GAGTCCATCA AATCCTTTCA GAAAACACCA CACTATTCCA AACTGCACCT GAAAACAAAA  1380
AGCCAGGATT TTCACTTCCA CCTGAAATAT CACAATTTGT CTCTCTACAC TGAGCATTCT  1440
GTGCAGGAGA AGAACTGGTA CAGTCTTGTC ATTCGTGAAG ATGGGAACAG TATCTCCAGC  1500
ATGATGGTAA AGGATACAGA AAGCAAAACA ACCAATGGGA TGACAACCGT GAGGTTTGTT  1560
AACACTTTGC ATAAAGATGT CAACATCTCC CTGAGTACAG ATACCTCTCT CAATGTTGGT  1620
GAAGACTATG GTGTGTCTGC TTATAGAACT GTGCAAAGAG GAGAATACCC TGCAGTGCAC  1680
TGTAGAACAG AAGATAAGAA CTTTTCTCTG AATTTGGGTC TTCTAGACTT TGGTGCAGCA  1740
TATCTGTTTG TTATTACTAA TAACACCAAT CAGGGTCTTC AGGCCTGGAA GATTGAAGAC  1800
ATTCCAGCCA ACAAAATGTC CATTGCGTGG CAGCTACCAC AATATGCCCT GGTTACAGCT  1860
GGGGAGGTCA TGTTCTCTGT CACAGGTCTT GAGTTTTCTT ATTCTCAGGC TCCCTCTAGC  1920
ATGAAATCTG TGCTCCAGGC AGCTTGGCTA TTGACAATTG CAGTTGGGAA TATCATCGTG  1980
CTTGTTGTGG CACAGTTCAG TGGCCTGGTA CAGTGGGCCG AATTCATTTT GTTTTCCTGC  2040
CTCCTGCTGG TGATCTGCCT GATCTTCTCC ATCATGGGCT ACTACTATGT TCCTGTAAAG  2100
ACAGAGGATA TGCGGGGTCC AGCAGATAAG CACATTCCTC ACATCCAGGG GAACATGATC  2160
AAACTAGAGA CCAAGAAGAC AAAACTCTGA
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SEQ ID NO:80 PDO5 Protein sequence:
Protein Accession #: XP_002922

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MNPFQKNESK ETLFSPVSIE EVPPRPPSPP KKPSPTICGS NYPLSIAFIV VNEFCERFSY    60
YGMKAVLILY FLYFLHWNED TSTSIYHAFS SLCYFTPILG AAIADSWLGK FKTIIYLSLV   120
YVLGHVIKSL GALPILGGQV VHTVLSLIGL SLIALGTGGI KPCVAAFGGD QFEEKHAEER   180
TRYFSVFYLS INAGSLISTF ITPMLRGDVQ CFGEDCYALA FGVPGLLMVI ALVVFAMGSK   240
IYNKPPPEGN IVAQVFKCIW FAISNRFKNR SGDIPKRQHW LDWAAEKYPK QLIMDVKALT   300
RVLFLYIPLP MFWALLDQQG SRWTLQAIRM NRNLGFFVLQ PDQMQVLNPF LVLIFIPLFD   360
FVIYRLVSKC GINFSSLRKM AVGMILACLA FAVAAAVEIK INEMAPAQSG PQEVFLQVLN   420
LADDEVKVTV VGNENNSLLI ESIKSFQKTP HYSKLHLKTK SQDFHFHLKY HNLSLYTEHS   480
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VQEKNWYSLV IREDGNSISS MMVKDTESKT TNGMTTVRFV NTLHKDVNIS LSTDTSLNVG   540
EDYGVSAYRT VQRGEYPAVH CRTEDKNFSL NLGLLDFGAA YLFVITNNTN QGLQAWKIED   600
IPANKMSIAW QLPQYALVTA GEVMFSVTGL EFSYSQAPSS MKSVLQAAWL LTIAVGNIIV   660
LVVAQFSGLV QWAEFILFSC LLLVICLIFS IMGYYYVPVK TEDMRGPADK HIPHIQGNMI   720
KLETKKTKL
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SEQ ID NO:81 PDO6 DNA SEQUENCE

Nucleic Acid Accession #: NM_020448
Coding sequence: 1-1221 (underlined sequences correspond to start and stop codons)

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AGCGCCGTAA GCGAGGCCTC CTTCTCCTAC AAGGAAAACC TGATTGGCGC CCTCTTGGCG    120
ATCTTCGGGC ACCTCGTGGT CAGCATTGCA CTTAACCTCC AGAAGTACTG CCACATCCGC    180
CTGGCAGGCT CCAAGGATCC CCGGGCCTAT TTCAAGACCA AGACATGGTG GCTGGGCCTG    240
TTCCTGATGC TTCTGGGCGA GCTGGGTGTG TTCGCCTCCT ACGCCTTCGC GCCGCTGTCA    300
CTCATCGTGC CCCTCAGCGC AGTTTCTGTG. ATAGCTAGTG CCATCATAGG AATCATATTC    360
ATCAAGGAAA AGTGGAAACC GAAAGACTTT CTGAGGCGCT ACGTCTTGTC CTTTGTTGGC    420
TGCGGTTTGG CTGTCGTGGG TACCTACCTG CTGGTGACAT TCGCACCCAA CAGTCACGAG    480
AAGATGACAG GCGAGAATGT CACCAGGCAC CTCGTGAGCT GGCCTTTCCT TTTGTACATG    540
CTGGTGGAGA TCATTCTGTT CTGCTTGCTG CTCTACTTCT ACAAGGAGAA GAACGCCAAC    600
AACATTGTCG TGATTCTTCT CTTGGTGGCG TTACTTGGCT CCATGACAGT GGTGACAGTC    660
AAGGCCGTGG CTGGGATGCT TGTCTTGTCC ATTCAAGGGA ACCTGCAGCT TGACTACCCC    720
ATCTTCTACG TGATGTTCGT GTGCATGGTG GCAACCGCCG TCTATCAGGC TGCGTTTTTG    780
AGTCAAGCCT CACAGATGTA CGACTCCTCT TTGATTGCCA GTGTGGGCTA CATTCTGTCC    840
ACAACCATTG CTATCACAGC AGGTGCAATA TTTTACCTGG ACTTCATCGG GGAGGACGTG    900
CTGCACATCT GCATGTTTGC ACTGGGGTGC CTCATTGCAT TCTTGGGCGT CTTCTTAATC    960
ACGCGTAACA GGAAGAAGCC CATTCCATTT GAGCCCTATA TTTCCATGGA TGCCATGCCA   1020
GGTATGCAGA ACATGCACGA TAAAGGGATG ACTGTCCAGC CTGAACTTAA AGCTTCTTTT   1080
TCCTATGGGG CTCTGGAAAA CAATGACAAC ATTTCTGAGA TCTACGCTCC TGCCACCCTG   1140
CCAGTCATGC AAGAAGAGCA CGGCTCCAGA AGTGCCTCTG GGTCCCCTA CCGAGTCCTA   1200
GAGCACACCA AGAAGGAATG A
```

SEQ ID NO:82 PDO6 Protein sequence
Protein Accession #: NP_065181

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1          11         21         31         41         51
|          |          |          |          |          |
MDGSHSAALK LQQLPPTSSS SAVSEASFSY KENLIGALLA IFGHLVVSIA LNLQKYCHIR     60
LAGSKDPRAY FKTKTWWLGL FLMLLGELGV FASYAFAPLS LIVPLSAVSV IASAIIGIIF    120
IKEKWKPKDF LRRYVLSFVG CGLAVVGTYL LVTFAPNSHE KMTGENVTRH LVSWPFLLYM    180
LVEIILFCLL LYFYKEKNAN NIVVILLLVA LLGSMTVVTV KAVAGMLVLS IQGNLQLDYP    240
IFYVMFVCMV ATAVYQAAFL SQASQMYDSS LIASVGYILS TTIAITAGAI FYLDFIGEDV    300
LHICMFALGC LIAFLGVFLI TRNRKKPIPF EPYISMDAMP GMQNMHDKGM TVQPELKASF    360
SYGALENNDN ISEIYAPATL PVMQEEHGSR SASGVPYRVL EHTKKE
```

SEQ ID NO:83 PDO8 DNA SEQUENCE

Nucleic Acid Accession #: NM_032712
Coding sequence: 555-908 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
CACTCATTAA GAACAGAGGA GGCTGCCTGT TACTCCTGGT GTTGCATCCC TCCAGACACT     60
CTGCTGTTTC CTGCCTAGGC GTGGCTGCAG CCATGGCTAG GAAAGCGCTG CCACCCACCC    120
ACCTGGGCCA GAGCTGGTTC TGCTCCTGCT GCAGGGACAC TGAGCTGGCT ATCTCGGCGC    180
TTCGGGCAAG AACTGCAACA GGCTCTCCTG GGTCCTGCAG GTGTACAGCC GGGCCCCTGC    240
CTTGTGCCTC AGCTCTCGAG AGCTGCTGCT GCCGGGTGAC CTGATCCAAC CTGATAAGGT    300
GCCATCTTCA GCTACCACTG CAAGGCCCTG AGGGCAACAG CAGCACGGCA CTGCCCACCC    360
GGCTGCTGAT GGCCTGGTGC CAGCTGGGAG TCCTCCCGGC ACTTCGAGGC CACTGAGCCA    420
CCCTTCCAGC CCCAGCCCAC CATGGACAGG GGTATCCAGC TTCCTCCTCA ACCTCGTCCT    480
CTGCCCCTGA GCCAGTGACG CCCAAGGACA TGCCTGTTAC CCAGGTCCTG TACCAGCACT    540
AGCTGGTCAA GGGCATGACA GTGCTGGAGG CCGTCTTGGA GATCCAGGCC ATCACTGGCA    600
GCAGGCTGCT CTCCATGGTG CCAGGGCCCG CCAGGCCACC AGGCTCATGC TGGGACCCAA    660
CCCAGTGCAC AAGGACTTGG CTGCTGAGCC ACACACCCAG GAGAAGGTGG ATAAGTGGGC    720
TACCAAGGGC TTCCTGCAGG CTAGGGGAGG AGCCACCCCC GCTTCCCTAT TGTGACCAGG    780
CCTATGGGGA GGAGCTGTCC ATACGCCACC GTGAGACCTG GGCCTGGCTC TCAAGGACAG    840
ACACCGCCTG GCCTGGTGCT CCAGGGGTGA AGCAGGCCAG AATCCTGGGG GAGCTGCTCC    900
TGGTTTGAGC TGCATTCAGG AAGTGCGGGA CATGGTAGGG GAGGCAAAAA GCCTTGGGCA    960
CTACCCTCCC TGTGGAGCTG TTCGGTGTCC GTCGAGCTAG CCACACCCTG ACACCATGTT   1020
CAAGGGTACC GGAAGAGAAG GGTGTCTGCC CCCAACCTCC CCTGTGGGTG TCACTGGCCA   1080
GATGTCATGA GGGAAGCAGG CCTTGTGAGT GGACACTGAC CATGAGTCCC TGGGGGGAGT   1140
GATCCCCCAG GCATCGTGTG CCATGTTGCA CTTCTGCCCA GGCAGCAGGG TGGGTGGGTA   1200
CCATGGGTGC CCACCCCTCC ACCACATGGG GCCCCAAAGC ACTGCAGGCC AAGCAGGGCA   1260
ACCCCACACC CTTGACATAA AAGCATCTTG AAGCTTTTAA AAAAAAAAAA AAAAAA
```

SEQ ID NO:84 PDO8 Protein sequence
Protein Accession #: NP_116101

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1          11         21         31         41         51
```

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|          |          |          |          |          |
MTVLEAVLEI QAITGSRLLS MVPGPARPPG SCWDPTQCTR TWLLSHTPRR RWISGLPRAS    60
CRLGEEPPPL PYCDQAYGEE LSIRHRETWA WLSRTDTAWP GAPGVKQARI LGELLLV
```

SEQ ID NO:85 PDT1 DNA SEQUENCE

Nucleic Acid Accession #: NM_000693
Coding sequence: 53-1591 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
AGCCGGTGCG CCGCAGACTA GGGCGCCTCG GGCCAGGGAG CGCGGAGGAG CCATGGCCAC    60
CGCTAACGGG GCCGTGGAAA ACGGGCAGCC GGACGGGAAG CCGCCGGCCC TGCCGCGCCC   120
CATCCGCAAC CTGGAGGTCA AGTTCACCAA GATATTTATC AACAATGAAT GGCACGAATC   180
CAAGAGTGGG AAAAAGTTTG CTACATGTAA CCCTTCAACT CGGGAGCAAA TATGTGAAGT   240
GGAAGAAGGA GATAAGCCCG ACGTGGACAA GGCTGTGGAG GCTGCACAGG TTGCCTTCCA   300
GAGGGGCTCG CCATGGCGCC GGCTGGATGC CCTGAGTCGT GGGCGGCTGC TGCACCAGCT   360
GGCTGACCTG GTGGAGAGGG ACCGCGCCAC CTTGGCCGCC CTGGAGACGA TGGATACAGG   420
GAAGCCATTT CTTCATGCTT TTTTCATCGA CCTGGAGGGC TGTATTAGAA CCCTCAGATA   480
CTTTGCAGGG TGGGCAGACA AAATCCAGGG CAAGACCATC CCCACAGATG ACAACGTCGT   540
ATGCTTCACC AGGCATGAGC CCATTGGTGT CTGTGGGGCC ATCACTCCAT GGAACTTCCC   600
CCTGCTGATG CTGGTGTGGA AGCTGGCACC CGCCCTCTGC TGTGGGAACA CCATGGTCCT   660
GAAGCCTGCG GAGCAGACAC CTCTCACCGC CCTTTATCTC GGCTCTCTGA TCAAAGAGGC   720
CGGGTTCCCT CCAGGAGTGG TGAACATTGT GCCAGGATTC GGGCCCACAG TGGGAGCAGC   780
AATTTCTTCT CACCCTCAGA TCAACAAGAT CGCCTTCACC GGCTCCACAG AGGTTGGAAA   840
ACTGGTTAAA GAAGCTGCGT CCCGGAGCAA TCTGAAGCGG GTGACGCTGG AGCTGGGGGG   900
GAAGAACCCC TGCATCGTGT GTGCGGACGC TGACTTGGAC TTGGCAGTGG AGTGTGCCCA   960
TCAGGGAGTG TTCTTCAACC AAGGCCAGTG TTGCACGGCA GCCTCCAGGG TGTTCGTGGA  1020
GGAGCAGGTC TACTCTGAGT TTGTCAGGCG GAGCGTGGAG TATGCCAAGA AACGGCCCGT  1080
GGGAGACCCC TTCGATGTCA AAACAGAACA GGGGCCTCAG ATTGATCAAA AGCAGTTCGA  1140
CAAAATCTTA GAGCTGATCG AGAGTGGGAA GAAGGAAGGG GCCAAGCTGG AATGCGGGGG  1200
CTCAGCCATG GAAGACAAGG GGCTCTTCAT CAAACCCACT GTCTTCTCAG AAGTCACAGA  1260
CAACATGCGG ATTGCCAAAG AGGAGATTTT CGGGCCAGTG CAACCAATAC TGAAGTTCAA  1320
AAGTATCGAA GAAGTGATAA AAAGAGCGAA TAGCACCGAC TATGGACTCA CAGCAGCCGT  1380
GTTCACAAAA AATCTCGACA AAGCCCTGAA GTTGGCTTCT GCCTTAGAGT CTGGAACGGT  1440
CTGGATCAAC TGCTACAACG CCCTCTATGC ACAGGCTCCA TTTGGTGGCT TTAAAATGTC  1500
AGGAAATGGC AGAGAACTAG GTGAATACGC TTTGGCCGAA TACACAGAAG TGAAAACTGT  1560
CACCATCAAA CTTGGCGACA AGAACCCCTG AAGGAAAGGC GGGGCTCCTT CCTCAAACAT  1620
CGGACGGCGG AATGTGGCAG ATGAAATGTG CTGGAGGAAA AAAATGACAT TTCTGACCTT  1680
CCCGGGACAC ATTCTTCTGG AGGCTTTACA TCTACTGGAG TTGAATGATT GCTGTTTTCC  1740
TCTCACTCTC CTGTTTATTC ACCAGACTGG GGATGCCTAT AGGTTGTCTG TGAAATCGCA  1800
GTCCTGCCTG GGGAGGGAGC TGTTGGCCAT TTCTGTGTTT CCCTTTAAAC CAGATCCTGG  1860
AGACAGTGAG ATACTCAGGG CGTTGTTAAC AGGGAGTGGT ATTTGAAGTG TCCAGCAGTT  1920
GCTTGAAATG CTTTGCCGAA TCTGACTCCA GTAAGAATGT GGGAAAACCC CCTGTGTGTT  1980
CTGCAAGCAG GGCTCTTGCA CCAGCGGTCT CCTCAGGGTG GACCTGCTTA CAGAGCAAGC  2040
CACGCCTCTT TCCGAGGTGA AGGTGGGACC ATTCCTTGGG AAAGGATTCA CAGTAAGGTT  2100
TTTTGGTTTT TGTTTTTTGT TTTCTTGTTT TTAAAAAAAG GATTTCACAG TGAGAAAGTT  2160
TTGGTTAGTG CATACCGTGG AAGGGCGCCA GGGTCTTTGT GGATTGCATG TTGACATTGA  2220
CCGTGAGATT CGGCTTCAAA CCAATACTGC CTTTGGAATA TGACAGAATC AATAGCCCAG  2280
AGAGCTTAGT CAAAGACGAT ATCACGGTCT ACCTTAACCA AGGCACTTTC TTAAGCAGAA  2340
AATATTGTTG AGGTTACCTT TGCTGCTAAA GATCCAATCT TCTAACGCCA CAACAGCATA  2400
GCAAATCCTA GGATAATTCA CCTCCTCATT TGACAAATCA GAGCTGTAAT TCACTTTAAC  2460
AAATTACGCA TTTCTATCAC GTTCACTAAC AGCTTATGAT AAGTCTGTGT AGTCTTCCTT  2520
TTCTCCAGTT CTGTTACCCA ATTTAGATTA GTAAAGCGTA CACAACTGGA AAGACTGCTG  2580
TAATAACACA GCCTTGTTAT TTTTAAGTCC TATTTTGATA TTAATTTCTG ATTAGTTAGT  2640
AAATAACACC TGGATTCTAT GGAGGACCTC GGTCTTCATC CAAGTGGCCT GAGTATTTCA  2700
CTGGCAGGTT GTGAATTTTT CTTTTCCTCT TTGGGAATCC AAATGATGAT GTGCAATTTC  2760
ATGTTTTAAC TTGGGAAACT GAAAGTGTTC CCATATAGCT TCAAAAACAA AAACAAATGT  2820
GTTATCCGAC GGATACTTTT ATGGTTACTA ACTAGTACTT TCCTAATTGG GAAAGTAGTG  2880
CTTAAGTTTG CAAATTAAGT TGGGGAGGGC AATAATAAAA TGAGGGCCCG TAACAGAACC  2940
AGTGTGTGTA TAACGAAAAC CATGTATAAA ATGGGCCTAT CACCCTTGTC AGAGATATAA  3000
ATTACCACAT TTGGCTTCCC TTCATCAGCT AACACTTATC ACTTATACTA CCAATAACTT  3060
GTTAAATCAG GATTTGGCTT CATACACTGA ATTTTCAGTA TTTTATCTCA AGTAGATATA  3120
GACACTAACC TTGATAGTGA TACGTTAGAG GGTTCCTATT CTTCCATTGT ACGATAATGT  3180
CTTTAATATG AAATGCTACA TTATTTATAA TTGGTAGAGT TATTGTATCT TTTTATAGTT  3240
GTAAGTACAC AGAGGTGGTA TATTTAAACT TCTGTAATAT ACTGTATTTA GAAATGGAAA  3300
TATATATAGT GTTAGGTTTC ACTTCTTTTA AGGTTTACCC CTGTGGTGTG GTTTAAAAAT  3360
CTATAGGCCT GGGAATTCCG ATCCTAGCTG CAGATCGCAT CCCACAATGC GAGAATGATA  3420
AAATAAAATT GGATATTTGA GA
```

SEQ ID NO:86 PDT1 PROTEIN SEQUENCE

Protein Accession #: NP_000684

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1          11         21         31         41         51
|          |          |          |          |          |
MATANGAVEN GQPDGKPPAL PRPIRNLEVK FTKIFINNEW HESKSGKKFA TCNPSTREQI    60
CEVEEGDKPD VDKAVEAAQV AFQRGSPWRR LDALSRGRLL HQLADLVERD RATLAALETM   120
DTGKPFLHAF FIDLEGCIRT LRYFAGWADK IQGKTIPTDD NVVCFTRHEP IGVCGAITPW   180
NFPLLMLVWK LAPALCCGNT MVLKPAEQTP LTALYLGSLI KEAGFPPGVV NIVPGFGPTV   240
GAAISSHPQI NKIAFTGSTE VGKLVKEAAS RSNLKRVTLE LGGKNPCIVC ADADLDLAVE   300
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CAHQGVFFNQ GQCCTAASRV FVEEQVYSEF VRRSVEYAKK RPVGDPFDVK TEQGPQIDQK   360
QFDKILELIE SGKKEGAKLE CGGSAMEDKG LFIKPTVFSE VTDNMRIAKE EIFGPVQPIL   420
KFKSIEEVIK RANSTDYGLT AAVFTKNLDK ALKLASALES GTVWINCYNA LYAQAPFGGF   480
KMSGNGRELG EYALAEYTEV KTVTIKLGDK NP
```

SEQ ID NO:87 PDV3 DNA SEQUENCE

Nucleic Acid Accession #: NM_032642
Coding sequence: 184-1263 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
GACCATTAGC AGGCACCCAG GCCTGTCTTT GGCTCGGAAA CGGTGGCCCC CAATGTAGCC     60
TAGTTTGAAC CTAGGAACTG CAGGACCAGA GAGATTCCAC TGGAGCCTGA TGGACGGGTG    120
ACAGAGGGAA CCCTACTCTG GAAACTGTCA GTCCCAGGGC ACTGGGGAGG GCTGAGGCCG    180
ACCATGCCCA GCCTGCTGCT GCTGTTCACG GCTGCTCTGC TGTCCAGCTG GGCTCAGCTT    240
CTGACAGACG CCAACTCCTG GTGGTCATTA GCTTTGAACC CGGTGCAGAG ACCCGAGATG    300
TTTATCATCG GTGCCCAGCC CGTGTGCAGT CAGCTTCCCG GGCTCTCCCC TGGCCAGAGG    360
AAGCTGTGCC AATTGTACCA GGAGCACATG GCCTACATAG GGGAGGGAGC CAAGACTGGC    420
ATCAAGGAAT GCCAGCACCA GTTCCGGCAG CGGCGGTGGA ATTGCAGCAC AGCGGACAAC    480
GCATCTGTCT TTGGGAGAGT CATGCAGATA GGCAGCCGAG AGACCGCCTT CACCCACGCG    540
GTGAGCGCCG CGGGCGTGGT CAACGCCATC AGCCGGGCCT GCCGCGAGGG CGAGCTCTCC    600
ACCTGCGGCT GCAGCCGGAC GGCGCGGCCC AAGGACCTGC CCCGGGACTG GCTGTGGGGC    660
GGCTGTGGGG ACAACGTGGA GTACGGCTAC CGCTTCGCCA AGGAGTTTGT GGATGCCCGG    720
GAGCGAGAGA AGAACTTTGC CAAAGGATCA GAGGAGCAGG GCCGGGTGCT CATGAACCTG    780
CAAAACAACG AGGCCGGTCG CAGGGCTGTG TATAAGATGG CAGACGTAGC CTGCAAATGC    840
CACGGCGTCT CGGGGTCCTG CAGCCTCAAG ACCTGCTGGC TGCAGCTGGC CGAGTTCCGC    900
AAGGTCGGGG ACCGGCTGAA GGAGAAGTAC GACAGCGCGG CCGCCATGCG CGTCACCCGC    960
AAGGGCCGGC TGGAGCTGGT CAACAGCCGC TTCACCCAGC CCACCCCGGA GGACCTGGTC   1020
TATGTGGACC CCAGCCCCGA CTACTGCCTG CGCAACGAGA GCACGGGCTC CCTGGGCACG   1080
CAGGGCCGCC TCTGCAACAA GACCTCGGAG GGCATGGATG GCTGTGAGCT CATGTGCTGC   1140
GGGCGTGGCT ACAACCAGTT CAAGAGCGTG CAGGTGGAGC GCTGCCACTG CAAGTTCCAC   1200
TGGTGCTGCT TCGTCAGGTG TAAGAAGTGC ACGGAGATCG TGGACCAGTA CATCTGTAAA   1260
TAGCCCGGAG GGCCTGCTCC CGGCCCCCCC TGCACTCTGC CTCACAAAGG TCTATATTAT   1320
ATAAATCTAT ATAAATCTAT TTTATATTTG TATAAGTAAA TGGGTGGGTG CTATACAATG   1380
GAAAGATGAA AATGGAAAGG AAGAGCTTAT TTAAGAGACG CTGGAGATCT CTGAGGAGTG   1440
GACTTTGCTG GTTCTCTCCT CTTGGTGGGT GGGAGACAGG GCTTTTTCTC TCCCTCTGGC   1500
GAGGACTCTC AGGATGTAGG GACTTGGAAA TATTTACTGT CTGTCCACCA CGGCCTGGAG   1560
GAGGGAGGTT GTGGTTGGAT GGAGGAGATG ATCTTGTCTG GAAGTCTAGA GTCTTTGTTG   1620
GTTAGAGGAC TGCCTGTGAT CCTGGCCACT AGGCCAAGAG GCCCTATGAA GGTGGCGGGA   1680
ACTCAGCTTC AACCTCGATG TCTTCAGGGT CTTGTCCAGA ATGTAGATGG GTTCCGTAAG   1740
AGGCCTGGTG CTCTCTTACT CTTTCATCCA CGTGCACTTG TGCGGCATCT GCAGTTTACA   1800
GGAACGGCTC CTTCCCTAAA ATGAGAAGTC CAAGGTCATC TCTGGCCCAG TGACCACAGA   1860
GAGATCTGCA CCTCCCGGAC TTCAGGCCTG CCTTTCCAGC GAGAATTCTT CATCCTCCAC   1920
GGTTCACTAG CTCCTACCTG AAGAGGAAAG GGGGCCATTT GACCTGACAT GTCAGGAAAG   1980
CCCTAAACTG AATGTTTGCG CCTGGGCTGC AGAAGCCAGG GTGCATGACC AGGCTGCGTG   2040
GACGTTATAC TGTCTTCCCC CACCCCCGGG GAGGGGAAGC TTGAGCTGCT GCTGTCACTC   2100
CTCCACCGAG GGAGGCCTCA CAAACCACAG GACGCTGCAA CGGGTCAGGC TGGCGGGCCC   2160
GGCGTGCTCA TCATCTCTGC CCCAGGTGTA CGGTTTCTCT CTGACATTAA ATGCCCTTCA   2220
TGGAAAAAAA AAAAAGAAAA AAAAAAAAAA AA
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SEQ ID NO:88 PDV3 Protein sequence
Protein Accession #: NP_116031

```
1          11         21         31         41         51
|          |          |          |          |          |
MPSLLLLFTA ALLSSWAQLL TDANSWWSLA LNPVQRPEMF IIGAQPVCSQ LPGLSPGQRK     60
LCQLYQEHMA YIGEGAKTGI KECQHQFRQR RWNCSTADNA SVFGRVMQIG SRETAFTHAV    120
SAAGVVNAIS RACREGELST CGCSRTARPK DLPRDWLWGG CGDNVEYGYR FAKEFVDARE    180
REKNFAKGSE EQGRVLMNLQ NNEAGRRAVY KMADVACKCH GVSGSCSLKT CWLQLAEFRK    240
VGDRLKEKYD SAAAMRVTRK GRLELVNSRF TQPTPEDLVY VDPSPDYCLR NESTGSLGTQ    300
GRLCNKTSEG MDGCELMCCG RGYNQFKSVQ VERCHCKFHW CCFVRCKKCT EIVDQYICK-
```

SEQ ID NO:89 PDT9 DNA SEQUENCE

Nucleic Acid Accession #: NM_033280
Coding sequence: 58-636 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
GGCAGCCGTC TGTGCCACCC AGAGCCGGCG GGCCGCTAGG TCCCCGGAGA CCCTGCTATG     60
GTGCGTGCGG GCGCCGTGGG GGCTCATCTC CCCGCGTCCG GCTTGGATAT CTTCGGGGAC    120
CTGAAGAAGA TGAACAAGCG CCAGCTCTAT TACCAGGTTT TAAACTTCGC CATGATCGTG    180
TCTTCTGCAC TCATGATATG GAAAGGCTTG ATCGTGCTCA CAGGCAGTGA GAGCCCCATC    240
GTGGTGGTGC TGAGTGGCAG TATGGAGCCG GCCTTTCACA GAGGAGACCT CCTGTTCCTC    300
ACAAATTTCC GGGAAGACCC AATCAGAGCT GGTGAAATAG TTGTTTTTAA AGTTGAAGGA    360
CGAGACATTC CAATAGTTCA CAGAGTAATC AAAGTTCATG AAAAAGATAA TGGAGACATC    420
AAATTTCTGA CTAAAGGAGA TAATAATGAA GTTGATGATA GAGGCTTGTA CAAAGAAGGC    480
CAGAACTGGC TGGAAAAAGAA GGACGTGGTG GGAAGAGCAA GAGGGTTTTT ACCATATGTT    540
GGTATGGTCA CCATAATAAT GAATGACTAT CCAAAATTCA AGTATGCTCT TTTGGCTGTA    600
ATGGGTGCAT ATGTGTTACT AAAACGTGAA TCCTAAAATG AGAAGCAGTT CCTGGGACCA    660
GATTGAAATG AATTCTGTTG AAAAAGAGAA AAACTAATAT ATTTGAGATG TTCCATTTTC    720
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TGTATAAAAG GGAACAGTGT GGAGATGTTT TTGTCTTGTC CAAATAAAAG ATTCACCAGT    780
AAAAAAAAAA AAAA
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SEQ ID NO:90 PDT9 Protein sequence
Protein Accession #: NP_150596

```
1          11         21         31         41         51
|          |          |          |          |          |
MVRAGAVGAH LPASGLDIFG DLKKMNKRQL YYQVLNFAMI VSSALMIWKG LIVLTGSESP     60
IVVVLSGSME PAFHRGDLLF LTNFREDPIR AGEIVVFKVE GRDIPIVHRV IKVHEKDNGD    120
IKFLTKGDNN EVDDRGLYKE GQNWLEKKDV VGRARGFLPY VGMVTIIMND YPKFKYALLA    180
VMGAYVLLKR ES
```

SEQ ID NO:91 PDV5 DNA SEQUENCE

Nucleic Acid Accession #: NM_016590
Coding sequence: 691-975 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
GATTACTCAC ACAGTCTTGA AGATGCAATG TCAGCTATTT AGGACAGAAA CATCCAAGGC     60
CGTGTCAGAA CTCAATTACG ACTACATATG CATTAAGGCA GGAACTGGCA GGCCTCAGGG    120
TACGCCAACT ATAGGACTCG TGCTTCTCGT ACGCTGGGCT ATAATCTATG AAACTGAGCT    180
CCAGAGCCAG CCAATCACTT AGCTCCTCAT AACAAGTCTA ACTGGCTCTG GAAAGCTGAA    240
AGGGCTGCAC TGGAACAACA CAGATGAGAT ATTCTACACA TTAATCTACT TATCTGGAAT    300
CACTTTGCCT CTAAAGGCCA GAGAAAAATC ACAGCTTCCT TGTCGGAGGG GAAAAGGACA    360
GGTGATCTGG GGAAAACGCA GCTACACCTG GAGCAAGGTC TCTTCCCGGC TTGGCAATCT    420
CAGCTGTGCC GGCGCTACGG GACCCGAGCC GTCCCAGAAA CCAAAGGGCA GGCACGGCAG    480
CAAACGCCTG AGTGCTGCTG CCTTCGGTGA CTATATGAGA ATGGAAACTT CTAAGGAAGC    540
CAGGTTGTTA GAATTGTTAC CCCCTTTACT CAGAGATAAC ATAGATTATC CAGGCTGAGA    600
TGGAAAACAA GCCCTTTATT GAATTTTCAA CACAGACTCC CTGCTTCTCA TCTCCTTAAT    660
AAAATTTCAT TAAAATCCCC TTGAACTCCC ATGTTCAAAT CTCCATTTGT TGACAGACAA    720
AGCCAACAAT ACTCTAAACT GAGGCCTGCA AGTCATTTCA TTTGTATTTT TGTCCAGAAA    780
TTTCCCATAG GAAGACTTCA CCTCCTACAA CTCCGAAGAA AACCCTTACT GTCCAAGACC    840
GTCACCAGCA ACCATCCGCA GTCATTCAAG TGGAAGCTTT CACAGCTTTT GTACATTCTC    900
TGTGTCAATA TACAACTGAG TTACAGACTG TCCCCTGGCT CCCTGACCCT TACAAACACT    960
AAAAGTTTTG TTTGACTCAA CTTCAAGCTG CTCATCTGTT AGTAAGTGAT GTTCACTCCA   1020
GAACACATTC ATGATGAGAA CTTTCTAAAA GACCAGCACT GCTCTTCCCC TCCTATAATC   1080
ATAATAATCA TGATAACCTG AAACATGTTA CTGGGACTCG ACATTTTTCT GGGGATTGAA   1140
ATCTTTAGTC CTTGGAGCTG TCACATAGCA GGGGCAACCT CACACTGAAA CAAAGGAAGT   1200
GATGTCCCAT TATTATCCAC CCTGAGCCAC CATAATATGC TGTTTACATT TATTTTCTTC   1260
AGCCTGTGCA AAACAAAGCA ATGGAAAAGG AAACTAAAAA ATATACATAC TAGTACCATT   1320
ATCTTCTTTT GCCTAAAATT ACTAATGCAC CACGTCAGTC TGCTTCCTTC AGGCATCATT   1380
CTCAATTCAT CAGGACTTGT ATTAGCAGGT TCTGGCTAGA GAGACTATCT CCTGTCATCA   1440
CGATCAATTA ATGTTTTCTG GTGATCACAT CAGGCCCTAT CTAAGAAGCT CATGGTATAC   1500
AAGGGTCACC CAAATAGCTG AGTGCAGTCC TTGCTCATAT TTCCTTCATC TTAACCCCGC   1560
AAACAAGAAT TAAGATGATC CCAATAAAAG AAAAATTGCT CAGGAAACTG AACCTTTTTC   1620
TGAACCAAGC ACTGTCAGCA AATCTCAGGT ATTAGAGCAA CTATGGTTGA TTGAAAAGTG   1680
TCTCAAAATC TGGGCCAAGA ATGATTGCTA GGTCCATAAG CTAATTTGTC TGGCCTTGCC   1740
ATTTACGTAA GCCAAAGAAA GTCACTCATG AGTAAACTAT AGAAAACGTT CAGACCCATC   1800
CTGTTAGTAT GTCAAATCAA CTAAGACTGG CAGGGTATTA ACTCCATTCC AGGTGACATG   1860
GATAAAGAGC CCCATTATTT TCACAGTGCC AGCCTCTACC TAAGGAAACC CTAGACCTTG   1920
GAACCAGTTT CCTGGTAGGG AACTGCTGAC AGTTTCAATG CTGACAGTTG GAGCCAATGC   1980
CTCATAGTGT AAACTGAAAG AAAAATAGTT GCTTTTTAAA ATGTCAGCAA GAAGGCCTGC   2040
CTCATCTTAA CAAAGCAAAA AAAAATGCTT TAATTCAAAT TAAAAATCAT GATACTAAAA   2100
AAAAAAAA
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SEQ ID NO:92 PDV5 Protein sequence
Protein Accession #: NP_057674

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1          11         21         31         41         51
|          |          |          |          |          |
MQCQLFRTET SKAVSELNYD YICIKAGTGR PQGTPTIGLV LLVRWAIIYE TELQSQPIT
```

SEQ ID NO:93 PEE6 DNA SEQUENCE

Nucleic Acid Accession #: NM_002606
Coding sequence: 61-1842 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
CGCGGCGGCT GGCGTCGGGA AAGTACAGTA AAAAGTCCGA GTGCAGCCGC CGGGCGCAGG     60
ATGGGATCCG GCTCCTCCAG CTACCGGCCC AAGGCCATCT ACCTGGACAT CGATGGACGC    120
ATTCAGAAGG TAATCTTCAG CAAGTACTGC AACTCCAGCG ACATCATGGA CCTGTTCTGC    180
ATCGCCACCG GCCTGCCTCG GAACACGACC ATCTCCCTGC TGACCACCGA CGACGCCATG    240
GTCTCCATCG ACCCCACCAT GCCCGCGAAT TCAGAACGCA CTCCGTACAA AGTGAGACCT    300
GTGGCCATCA AGCAACTCTC CGCTGGTGTC GAGGACAAGA GAACCACAAG CCGTGGCCAG    360
TCTGCTGAGA GACCACTGAG GGACAGACGG GTTGTGGGCC TGGAGCAGCC CCGGAGGGAA    420
GGAGCATTTG AAAGTGGACA GGTAGAGCCC AGGCCCAGAG AGCCCCAGGG CTGCTACCAG    480
GAAGGCCAGC GCATCCCTCC AGAGAGAGAA GAATTAATCC AGAGCGTGCT GGCGCAGGTT    540
GCAGAGCAGT TCTCAAGAGC ATTCAAAATC AATGAACTGA AAGCTGAAGT TGCAAATCAC    600
TTGGCTGTCC TAGAGAAACG CGTGGAATTG GAAGGACTAA AAGTGGTGGA GATTGAGAAA    660
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TGCAAGAGTG ACATTAAGAA GATGAGGGAG GAGCTGGCGG CCAGAAGCAG CAGGACCAAC   720
TGCCCCTGTA AGTACAGTTT TTTGGATAAC CACAAGAAGT TGACTCCTCG ACGCGATGTT   780
CCCACTTACC CCAAGTACCT GCTCTCTCCA GAGACCATCG AGGCCCTGCG GAAGCCGACC   840
TTTGACGTCT GGCTTTGGGA GCCCAATGAG ATGCTGAGCT GCCTGGAGCA CATGTACCAC   900
GACCTCGGGC TGGTCAGGGA CTTCAGCATC AACCCTGTCA CCCTCAGGAG GTGGCTGTTC   960
TGTGTCCACG ACAACTACAG AAACAACCCC TTCCACAACT TCCGGCACTG CTTCTGCGTG  1020
GCCCAGATGA TGTACAGCAT GGTCTGGCTC TGCAGTCTCC AGGAGAAGTT CTCACAAACG  1080
GATATCCTGA TCCTAATGAC AGCGGCCATC TGCCACGATC TGGACCATCC CGGCTACAAC  1140
AACACGTACC AGATCAATGC CCGCACAGAG CTGGCGGTCC GCTACAATGA CATCTCACCG  1200
CTGGAGAACC ACCACTGCGC CGTGGCCTTC CAGATCCTCG CCGAGCCTGA GTGCAACATC  1260
TTCTCCAACA TCCCACCTGA TGGGTTCAAG CAGATCCGAC AGGGAATGAT CACATTAATC  1320
TTGGCCACTG ACATGGCAAG ACATGCAGAA ATTATGGATT CTTTCAAAGA GAAAATGGAG  1380
AATTTTGACT ACAGCAACGA GGAGCACATG ACCCTGCTGA AGATGATTTT GATAAAATGC  1440
TGTGATATCT CTAACGAGGT CCGTCCAATG GAAGTCGCAG AGCCTTGGGT GGACTGTTTA  1500
TTAGAGGAAT ATTTTATGCA GAGCGACCGT GAGAAGTCAG AAGGCCTTCC TGTGGCACCG  1560
TTCATGGACC GAGACAAAGT GACCAAGGCC ACAGCCCAGA TTGGGTTCAT CAAGTTTGTC  1620
CTGATCCCAA TGTTTGAAAC AGTGACCAAG CTCTTCCCCA TGGTTGAGGA GATCATGCTG  1680
CAGCCACTTT GGGAATCCCG AGATCGCTAC GAGGAGCTGA AGCGGATAGA TGACGCCATG  1740
AAAGAGTTAC AGAAGAAGAC TGACAGCTTG ACGTCTGGGG CCACCGAGAA GTCCAGAGAG  1800
AGAAGCAGAG ATGTGAAAAA CAGTGAAGGA GACTGTGCCT GAGGAAAGCG GGGGGCGTGG  1860
CTGCAGTTCT GGACGGGCTG GCCGAGCTGC GCGGGATCCT TGTGCAGGGA AGAGCTGCCC  1920
TGGGCACCTG GCACCACAAG ACCATGTTTT CTAAGAACCA TTTTGTTCAC TGATACAAAA  1980
AAAAAAAAAA A
```

SEQ ID NO:94 PEE6 Protein sequence
Protein Accession #: NP_002597

```
1          11         21         31         41         51
|          |          |          |          |          |
MGSGSSSYRP KAIYLDIDGR IQKVIFSKYC NSSDIMDLFC IATGLPRNTT ISLLTTDDAM    60
VSIDPTMPAN SERTPYKVRP VAIKQLSAGV EDKRTTSRGQ SAERPLRDRR VVGLEQPRRE   120
GAFESGQVEP RPREPQGCYQ EGQRIPPERE ELIQSVLAQV AEQFSRAFKI NELKAEVANH   180
LAVLEKRVEL EGLKVVEIEK CKSDIKKMRE ELAARSSRTN CPCKYSFLDN HKKLTPRRDV   240
PTYPKYLLSP ETIEALRKPT FDVWLWEPNE MLSCLEHMYH DLGLVRDFSI NPVTLRRWLF   300
CVHDNYRNNP FHNFRHCFCV AQMMYSMVWL CSLQEKFSQT DILILMTAAI CHDLDHPGYN   360
NTYQINARTE LAVRYNDISP LENHHCAVAF QILAEPECNI FSNIPPDGFK QIRQGMITLI   420
LATDMARHAE IMDSFKEKME NFDYSNEEHM TLLKMILIKC CDISNEVRPM EVAEPWVDCL   480
LEEYFMQSDR EKSEGLPVAP FMDRDKVTKA TAQIGFIKFV LIPMFETVTK LFPMVEEIML   540
QPLWESRDRY EELKRIDDAM KELQKKTDSL TSGATEKSRE RSRDVKNSEG DCA
```

SEQ ID NO:95 PEG4 DNA SEQUENCE

Nucleic Acid Accession #: none
Coding sequence: 41-559 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
CAGTCACAGG CGAGAGCCYT GGGATGCACC GGCCAGAGGC ATGCTGCTGC TGCTCACGCT    60
TGCCCTCCTG GGGGGCCCCA CCTGGGCAGG GAAGATGTAT GGCCCTGGAG GAGGCAAGTA   120
TTTCAGCACC ACTGAAGACT ACGACCATGA AATCACAGGG CTGCGGGTGT CTGTAGGTCT   180
TCTCCTGGTG AAAAGTGTCC AGGTGAAACT TGGAGACTCC TGGGACGTGA AACTGGGAGC   240
CTTAGGTGGG AATACCCAGG AAGTCACCCT GCAGCCAGGC GAATACATCA CAAAAGTCTT   300
TGTCGCCTTC CAAGCTTTCC TCCGGGGTAT GGTCATGTAC ACCAGCAAGG ACCGCTATTT   360
CTATTTTGGG AAGCTTGATG GCCAGATCTC CTCTGCCTAC CCCAGCCAAG AGGGGCAGGT   420
GCTGGTGGGC ATCTATGGCC AGTATCAACT CCTTGGCATC AAGAGCATTG GCTTTGAATG   480
GAATTATCCA CTAGAGGAGC CGACCACTGA GCCACCAGTT AATCTCACAT ACTCAGCAAA   540
CTCACCCGTG GGTCGCTAGG GTGGGGTATG GGCCATCCG AGCTGAGGCC ATCTGTGTGG   600
TGGTGGCTGA TGGTACTGGA GTAACTGAGT CGGGACGCTG AATCTGAATC CACCAATAAA   660
TAAAGCTTCT GCAGAATCAG TGAAAAAAAA A
```

SEQ ID NO:96 PEG4 Protein sequence
Protein Accession #: FGENESH predicted

```
1          11         21         31         41         51
|          |          |          |          |          |
MLLLLTLALL GGPTWAGKMY GPGGGKYFST TEDYDHEITG LRVSVGLLLV KSVQVKLGDS    60
WDVKLGALGG NTQEVTLQPG EYITKVFVAF QAFLRGMVMY TSKDRYFYFG KLDGQISSAY   120
PSQEGQVLVG IYGQYQLLGI KSIGFEWNYP LEEPTTEPPV NLTYSANSPV GR
```

SEQ ID NO:97 PEL9 DNA SEQUENCE

Nucleic Acid Accession #: NM_006953
Coding sequence: 33-896(underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
CCGTTCCGCG CTCTGGCGGC TCCTCCCGGG CGATGCCTCC GCTCTGGGCC CTGCTGGCCC    60
TCGGCTGCCT GCGGTTCGGC TCGGCTGTGA ACCTGCAGCC CCAACTGGCC AGTGTGACTT   120
TCGCCACCAA CAACCCCACA CTTACCACTG TGGCCTTGGA AAAGCCTCTC TGCATGTTTG   180
ACAGCAAAGA GGCCCTCACT GGCACCCACG AGGTCTACCT GTATGTCCTG GTCGACTCAG   240
CCATTTCCAG GAATGCCTCA GTGCAAGACA GCACCAACAC CCCACTGGGC TCAACGTTCC   300
```

```
TACAAACAGA GGGTGGGAGG ACAGGTCCCT ACAAAGCTGT GGCCTTTGAC CTGATCCCCT   360
GCAGTGACCT GCCCAGCCTG GATGCCATTG GGGATGTGTC CAAGGCCTCA CAGATCCTGA   420
ATGCCTACCT GGTCAGGGTG GGTGCCAACG GGACCTGCCT GTGGGATCCC AACTTCCAGG   480
GCCTCTGTAA CGCACCCCTG TCGGCAGCCA CGGAGTACAG GTTCAAGTAT GTCCTGGTCA   540
ATATGTCCAC GGGCTTGGTA GAGGACCAGA CCCTGTGGTC GGACCCCATC CGCACCAACC   600
AGCTCACCCC ATACTCGACG ATCGACACGT GGCCAGGCCG GCGGAGCGGA GGCATGATCG   660
TCATCACTTC CATCCTGGGC TCCCTGCCCT TCTTTCTACT TGTGGGTTTT GCTGGCGCCA   720
TTGCCCTCAG CCTCGTGGAC ATGGGGAGTT CTGATGGGGA AACGACTCAC GACTCCCAAA   780
TCACTCAGGA GGCTGTTCCC AAGTCGCTGG GGGCCTCGGA GTCTTCCTAC ACGTCCGTGA   840
ACCGGGGGCC GCCACTGGAC AGGGCTGAGG TGTATTCCAG CAAGCTCCAA GACTGAGCCC   900
AGCACCACCC CTGGGCAGCA GCATCCTCCT CTCTGGCCTT GCCCCAGGCC CTGCAGCGGT   960
GGTTGTCACA CCCTGACTTC AGGGAAGGTG AAACAGGGCT TGTCCCTCCA ACTGCAGGAA  1020
AACCCTTAAT AAAATCTTCT GATGAGTTCT AAAAAAAAA
```

SEQ ID NO:98 PEL9 Protein sequence
Protein Accession #: NP_008884

```
1          11         21         31         41         51
|          |          |          |          |          |
MPPLWALLAL GCLRFGSAVN LQPQLASVTF ATNNPTLTTV ALEKPLCMFD SKEALTGTHE    60
VYLYVLVDSA ISRNASVQDS TNTPLGSTFL QTEGGRTGPY KAVAFDLIPC SDLPSLDAIG   120
DVSKASQILN AYLVRVGANG TCLWDPNFQG LCNAPLSAAT EYRFKYVLVN MSTGLVEDQT   180
LWSDPIRTNQ LTPYSTIDTW PGRRSGGMIV ITSILGSLPF FLLVGFAGAI ALSLVDMGSS   240
DGETTHDSQI TQEAVPKSLG ASESSYTSVN RGPPLDRAEV YSSKLQD
```

SEQ ID NO:99 PEN1 DNA SEQUENCE

Nucleic Acid Accession #: NM_012391
Coding sequence: 416-1423 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
GTCTGACTTC CTCCCAGCAC ATTCCTGCAC TCTGCCGTGT CCACACTGCC CCACAGACCC    60
AGTCCTCCAA GCCTGCTGCC AGCTCCCTGC AAGCCCCTCA GGTTGGGCCT TGCCACGGTG   120
CCAGCAGGCA GCCCTGGGCT GGGGGTAGGG GACTCCCTAC AGGCACGCAG CCCTGAGACC   180
TCAGAGGGCC ACCCCTTGAG GGTGGCCAGG CCCCCAGTGG CCAACCTGAG TGCTGCCTCT   240
GCCACCAGCC CTGCTGGCCC CTGGTTCCGC TGGCCCCCCA GATGCCTGGC TGAGACACGC   300
CAGTGGCCTC AGCTGCCCAC ACCTCTTCCC GGCCCCTGAA GTTGGCACTG CAGCAGACAG   360
CTCCCTGGGC ACCAGGCAGC TAACAGACAC AGCCGCCAGC CCAAACAGCA GCGGCATGGG   420
CAGCGCCAGC CCGGGTCTGA GCAGCGTATC CCCCAGCCAC CTCCTGCTGC CCCCCGACAC   480
GGTGTCGCGG ACAGGCTTGG AGAAGGCGGC AGCGGGGGCA GTGGGTCTCG AGAGACGGGA   540
CTGGAGTCCC AGTCCACCCG CCACGCCCGA GCAGGGCCTG TCCGCCTTCT ACCTCTCCTA   600
CTTTGACATG CTGTACCCTG AGGACAGCAG CTGGGCAGCC AAGGCCCCTG GGCCAGCAG    660
TCGGGAGGAG CCACCTGAGG AGCCTGAGCA GTGCCCGGTC ATTGACAGCC AAGCCCCAGC   720
GGGCAGCCTG GACTTGGTGC CCGGCGGGCT GACCTTGGAG GAGCACTCGC TGGAGCAGGT   780
GCAGTCCATG GTGGTGGGCG AAGTGCTCAA GGACATCGAG ACGGCCTGCA AGCTGCTCAA   840
CATCACCGCA GATCCCATGG ACTGGAGCCC CAGCAATGTG CAGAAGTGGC TCCTGTGGAC   900
AGAGCACCAA TACCGGCTGC CCCCCATGGG CAAGGCCTTC CAGGAGCTGG CGGGCAAGGA   960
GCTGTGCGCC ATGTCGGAGG AGCAGTTCCG CCAGCGCTCG CCCCTGGGTG GGGATGTGCT  1020
GCACGCCCAC CTGGACATCT GGAAGTCAGC GGCCTGGATG AAAGAGCGGA CTTCACCTGG  1080
GGCGATTCAC TACTGTGCCT CGACCAGTGA GGAGAGCTGG ACCGACAGCG AGGTGGACTC  1140
ATCATGCTCC GGGCAGCCCA TCCACCTGTG GCAGTTCCTC AAGGAGTTGC TACTCAAGCC  1200
CCACAGCTAT GGCCGCTTCA TTAGGTGGCT CAACAAGGAG AAGGGCATCT TCAAAATTGA  1260
GGACTCAGCC CAGGTGGCCC GGCTGTGGGG CATCCGCAAG AACCGTCCCG CCATGAACTA  1320
CGACAAGCTG AGCCGCTCCA TCCGCCAGTA TTACAAGAAG GGCATCATCC GGAAGCCAGA  1380
CATCTCCCAG CGCCTCGTCT ACCAGTTCGT GCACCCCATC TGAGTGCCTG GCCCAGGGCC  1440
TGAAACCCGC CCTCAGGGGC CTCTCTCCTG CCTGCCCTGC CTCAGCCAGG CCCTGAGATG  1500
GGGGAAAACG GGCAGTCTGC TCTGCTGCTC TGACCTTCCA GAGCCCAAGG TCAGGGAGGG  1560
GCAACCAACT GCCCCAGGGG GATATGGGTC CTCTGGGGCC TTCGGGACCA TGGGGCAGGG  1620
GTGCTTCCTC CTCAGGCCCA GCTGCTCCCC TGGAGGACAG AGGGAGACAG GGCTGCTCCC  1680
CAACACCTGC CTCTGACCCC AGCATTTCCA GAGCAGAGCC TACAGAAGGG CAGTGACTCG  1740
ACAAAGGCCA CAGGCAGTCC AGGCCTCTCT CTGCTCCATC CCCCTGCCTC CCATTCTGCA  1800
CCACACCTGG CATGGTGCAG GGAGACATCT GCACCCCTGA GTTGGGCAGC CAGGAGTGCC  1860
CCCGGGAATG GATAATAAAG ATACTAGAGA ACTG
```

SEQ ID NO:100 PEN1 Protein sequence
Protein Accession #: NP_036523

```
1          11         21         31         41         51
|          |          |          |          |          |
MGSASPGLSS VSPSHLLLPP DTVSRTGLEK AAAGAVGLER RDWSPSPPAT PEQGLSAFYL    60
SYFDMLYPED SSWAAKAPGA SSREEPPEEP EQCPVIDSQA PAGSLDLVPG GLTLEEHSLE   120
QVQSMVVGEV LKDIETACKL LNITADPMDW SPSNVQKWLL WTEHQYRLPP MGKAFQELAG   180
KELCAMSEEQ FRQRSPLGGD VLHAHLDIWK SAAWMKERTS PGAIHYCAST SEESWTDSEV   240
DSSCSGQPIH LWQFLKELLL KPHSYGRFIR WLNKEKGIFK IEDSAQVARL WGIRKNRPAM   300
NYDKLSRSIR QYYKKGIIRK PDISQRLVYQ FVHPI
```

SEQ ID NO:101 PEN3 DNA SEQUENCE

Nucleic Acid Accession #: NM_000742
Coding sequence: 555-2144 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
GAGAGAACAG CGTGAGCCTG TGTGCTTGTG TGCTGAGCCC TCATCCCCTC CTGGGGCCAG   60
GCTTGGGTTT CACCTGCAGA ATCGCTTGTG CTGGGCTGCC TGGGCTGTCC TCAGTGGCAC  120
CTGCATGAAG CCGTTCTGGC TGCCAGAGCT GGACAGCCCC AGGAAAACCC ACCTCTCTGC  180
AGAGCTTGCC CAGCTGTCCC CGGGAAGCCA AATGCCTCTC ATGTAAGTCT TCTGCTCGAC  240
GGGGTGTCTC CTAAACCCTC ACTCTTCAGC CTCTGTTTGA CCATGAAATG AAGTGACTGA  300
GCTCTATTCT GTACCTGCCA CTCTATTTCT GGGGTGACTT TTGTCAGCTG CCCAGAATCT  360
CCAAGCCAGG CTGGTTCTCT GCATCCTTTC AATGACCTGT TTTCTTCTGT AACCACAGGT  420
TCGGTGGTGA GAGGAAGCCT CGCAGAATCC AGCAGAATCC TCACAGAATC CAGCAGCAGC  480
TCTGCTGGGG ACATGGTCCA TGGTGCAACC CACAGCAAAG CCCTGACCTG ACCTCCTGAT  540
GCTCAGGAGA AGCCATGGGC CCCTCCTGTC CTGTGTTCCT GTCCTTCACA AAGCTCAGCC  600
TGTGGTGGCT CCTTCTGACC CCAGCAGGTG GAGAGGAAGC TAAGCGCCCA CCTCCCAGGG  660
CTCCTGGAGA CCCACTCTCC TCTCCCAGTC CCACGGCATT GCCGCAGGGA GGCTCGCATA  720
CCGAGACTGA GGACCGGCTC TTCAAACACC TCTTCCGGGG CTACAACCGC TGGGCGCGCC  780
CGGTGCCCAA CACTTCAGAC GTGGTGATTG TGCGCTTTGG ACTGTCCATC GCTCAGCTCA  840
TCGATGTGGA TGAGAAGAAC CAAATGATGA CCACCAACGT CTGGCTAAAA CAGGAGTGGA  900
GCGACTACAA ACTGCGCTGG AACCCCGCTG ATTTTGGCAA CATCACATCT CTCAGGGTCC  960
CTTCTGAGAT GATCTGGATC CCCGACATTG TTCTCTACAA CAATGCAGAT GGGGAGTTTG 1020
CAGTGACCCA CATGACCAAG GCCCACCTCT TCTCCACGGG CACTGTGCAC TGGGTGCCCC 1080
CGGCCATCTA CAAGAGCTCC TGCAGCATCG ACGTCACCTT CTTCCCCTTC GACCAGCAGA 1140
ACTGCAAGAT GAAGTTTGGC TCCTGGACTT ATGACAAGGC CAAGATCGAC CTGGAGCAGA 1200
TGGAGCAGAC TGTGGACCTG AAGGACTACT GGGAGAGCGG CGAGTGGGCC ATCGTCAATG 1260
CCACGGGCAC CTACAACAGC AAGAAGTACG ACTGCTGCGC CGAGATCTAC CCCGACGTCA 1320
CCTACGCCTT CGTCATCCGG CGGCTGCCGC TCTTCTACAC CATCAACCTC ATCATCCCCT 1380
GCCTGCTCAT CTCCTGCCTC ACTGTGCTGG TCTTCTACCT GCCCTCCGAC TGCGGCGAGA 1440
AGATCACGCT GTGCATTTCG GTGCTGCTGT CACTCACCGT CTTCCTGCTG CTCATCACTG 1500
AGATCATCCC GTCCACCTCG CTGGTCATCC CGCTCATCGG CGAGTACCTG CTGTTCACCA 1560
TGATCTTCGT CACCCTGTCC ATCGTCATCA CCGTCTTCGT GCTCAATGTG CACCACCGCT 1620
CCCCCAGCAC CCACACCATG CCCCACTGGG TGCGGGGGGC CCTTCTGGGC TGTGTGCCCC 1680
GGTGGCTTCT GATGAACCGG CCCCCACCAC CCGTGGAGCT CTGCCACCCC CTACGCCTGA 1740
AGCTCAGCCC CTCTTATCAC TGGCTGGAGA GCAACGTGGA TGCCGAGGAG AGGGAGGTGG 1800
TGGTGGAGGA GGAGGACAGA TGGGCATGTG CAGGTCATGT GGCCCCCTCT GTGGGCACCC 1860
TCTGCAGCCA CGGCCACCTG CACTCTGGGG CCTCAGGTCC CAAGGCTGAG GCTCTGCTGC 1920
AGGAGGGTGA GCTGCTGCTA TCACCCCACA TGCAGAAGGC ACTGGAAGGT GTGCACTACA 1980
TTGCCGACCA CCTGCGGTCT GAGGATGCTG ACTCTTCGGT GAAGGAGGAC TGGAAGTATG 2040
TTGCCATGGT CATCGACAGG ATCTTCCTCT GGCTGTTTAT CATCGTCTGC TTCCTGGGGA 2100
CCATCGGCCT CTTTCTGCCT CCGTTCCTAG CTGGAATGAT CTGACTGCAC CTCCCTCGAG 2160
CTGGCTCCCA GGGCAAAGGG GAGGGTTCTT GGATGTGGAA GGGCTTTGAA CAATGTTTAG 2220
ATTTGGAGAT GAGCCCAAAG TGCCAGGGAG AACAGCCAGG TGAGGTGGGA GGTTGGAGAG 2280
CCAGGTGAGG TCTCTCTAAG TCAGGCTGGG GTTGAAGTTT GGAGTCTGTC CGAGTTTGCA 2340
GGGTGCTGAG CTGTATGGTC CAGCAGGGGA GTAATAAGGG CTCTTCCGGA AGGGGAGGAA 2400
GCGGGAGGCA GGCCTGCACC TGATGTGGAG GTACAGGCAG ATCTTCCCTA CCGGGGAGGG 2460
ATGGATGGTT GGATACAGGT GGCTGGGCTA TTCCATCCAT CTGGAAGCAC ATTTGAGCCT 2520
CCAGGCTTCT CCTTGACGTC ATTCCTCTCC TTCCTTGCTG CAAAATGGCT CTGCACCAGC 2580
CGGCCCCCAG GAGGTCTGGC AGAGCTGAGA GCCATGGCCT GCAGGGGCTC CATATGTCCC 2640
TACGCGTGCA GCAGGCAAAC AAGA
```

SEQ ID NO:102 PEN3 Protein sequence

Protein Accession #: NP_000733

```
1          11         21         31         41         51
|          |          |          |          |          |
MGPSCPVFLS FTKLSLWWLL LTPAGGEEAK RPPPRAPGDP LSSPSPTALP QGGSHTETED   60
RLFKHLFRGY NRWARPVPNT SDVVIVRFGL SIAQLIDVDE KNQMMTTNVW LKQEWSDYKL  120
RWNPADFGNI TSLRVPSEMI WIPDIVLYNN ADGEFAVTHM TKAHLFSTGT VHWVPPAIYK  180
SSCSIDVTFF PFDQQNCKMK FGSWTYDKAK IDLEQMEQTV DLKDYWESGE WAIVNATGTY  240
NSKKYDCCAE IYPDVTYAFV IRRLPLFYTI NLIIPCLLIS CLTVLVFYLP SDCGEKITLC  300
ISVLLSLTVF LLLITEIIPS TSLVIPLIGE YLLFTMIFVT LSIVITVFVL NVHHRSPSTH  360
TMPHWVRGAL LGCVPRWLLM NRPPPPVELC HPLRLKLSPS YHWLESNVDA EEREVVVEEE  420
DRWACAGHVA PSVGTLCSHG HLHSGASGPK AEALLQEGEL LLSPHMQKAL EGVHYIADHL  480
RSEDADSSVK EDWKYVAMVI DRIFLWLFII VCFLGTIGLF LPPFLAGMI
```

SEQ ID NO:103 PEU4 DNA SEQUENCE

Nucleic Acid Accession #: NM_018670

Coding sequence: 87-893 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
CACGAGGCTG GAAGGGGCCA CTTCACACCT CGGGCTCGGC ATAAAGCGGC CGCCGGCCGC   60
CGGCCCCCAG ACGCGCCGCC GCTGCCATGG CCCAGCCCCT GTGCCCGCCG CTCTCCGAGT  120
CCTGGATGCT CTCTGCGGCC TGGGGCCCAA CTCGGCGGCC GCCGCCCTCC GACAAGGACT  180
GCGGCCGCTC CCTCGTCTCG TCCCCAGACT CATGGGGCAG CACCCCAGCC GACAGCCCCG  240
TGGCGAGCCC CGCGCGGCCA GGCACCCTCC GGGACCCCCG CGCCCCCTCC GTAGGTAGGC  300
GCGGCGCGCG CAGCAGCCGC CTGGGCAGCG GGCAGAGGCA GAGCGCCAGT GAGCGGGAGA  360
AACTGCGCAT GCGCACGCTG GCCCGCGCCC TGCACGAGCT GCGCCGCTTT CTACCGCCGT  420
CCGTGGCGCC CGCGGGCCAG AGCCTGACCA AGATCGAGAC GCTGCGCCTG GCTATCCGCT  480
ATATCGGCCA CCTGTCGGCC GTGCTAGGCC TCAGCGAGGA GAGTCTCCAG CGCCGGTGCC  540
GGCAGCGCGG TGACGCGGGG TCCCCTCGGG GCTGCCCGCT GTGCCCCGAC GACTGCCCCG  600
CGCAGATGCA GACACGGACG CAGGCTGAGG GGCAGGGGCA GGGGCGCGGG CTGGGCCTGG  660
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TATCCGCCGT CCGCGCCGGG GCGTCCTGGG GATCCCCGCC TGCCTGCCCC GGAGCCCGAG   720
CTGCACCCGA GCCGCGCGAC CCGCCTGCGC TGTTCGCCGA GGCGGCGTGC CCGGAAGGGC   780
AGGCGATGGA GCCAAGCCCA CCGTCCCCGC TCCTTCCGGG CGACGTGCTG GCTCTGTTGG   840
AGACCTGGAT GCCCCTCTCG CCTCTGGAGT GGCTGCCTGA GGAGCCCAAG TGACAAGGGA   900
CAACTGACGC CGTCTCTGTG AGCACCGAGG CTTTTTGGCC TCAGCACCTT CGAAGTGGTT   960
CCTTGGCAGA CTGCCTTTCC TGGAAGAGGG CACGGGCGAT CCCGACGGGG GCATTCCTGC  1020
GGGTGAGAGC CGTCCCCACC GCGGCGGCCC TTCTCAGCCC CTCCCTCCAT GGAGGGACCC  1080
ATAGGGCTAG ACACTTTGAG GCAAGCAGGA GGCTCTGCCT AATGTGAATT TATTTATTTG  1140
TGAATAAACT GTACTGGTGT CAAAAAAAAA AAAAAAAAAA A
```

SEQ ID NO:104 PEU4 Protein sequence

Protein Accession #: NP_061140

```
1          11         21         31         41         51
|          |          |          |          |          |
MAQPLCPPLS ESWMLSAAWG PTRRPPPSDK DCGRSLVSSP DSWGSTPADS PVASPARPGT    60
LRDPRAPSVG RRGARSSRLG SGQRQSASER EKLRMRTLAR ALHELRRFLP PSVAPAGQSL   120
TKIETLRLAI RYIGHLSAVL GLSEESLQRR CRQRGDAGSP RGCPLCPDDC PAQMQTRTQA   180
EGQGQGRGLG LVSAVRAGAS WGSPPACPGA RAAPEPRDPP ALPAEAACPE GQAMEPSPPS   240
PLLPGDVLAL LETWMPLSPL EWLPEEPK
```

SEQ ID NO:105 PEU5 DNA SEQUENCE

Nucleic Acid Accession #: NM_017636

Coding sequence: 324-3374 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
CCACGGAGAA GCCCACCGAT GCCTACGGAG AGCTGGACTT CACGGGGGCC GGCCGCAAGC    60
ACAGCAATTT CCTCCGGCTC TCTGACCGAA CGGATCCAGC TGCAGTTTAT AGTCTGGTCA   120
CACGCACATG GGGCTTCCGT GCCCCGAACC TGGTGGTGTC AGTGCTGGGG GGATCGGGGG   180
GCCCCGTCCT CCAGACCTGG CTGCAGGACC TGCTGCGTCG TGGGCTGGTG CGGGCTGCCC   240
AGAGCACAGG AGCCTGGATT GTCACTGGGG GTCTGCACAC GGGCATCGGC CGGCATGTTG   300
GTGTGGCTGT ACGGGACCAT CAGATGGCCA GCACTGGGGG CACCAAGGTG GTGGCCATGG   360
GTGTGGCCCC CTGGGGTGTG GTCCGGAATA GAGACACCCT CATCAACCCC AAGGGCTCGT   420
TCCCTGCGAG GTACCGGTGG CGCGGTGACC CGGAGGACGG GGTCCAGTTT CCCCTGGACT   480
ACAACTACTC GGCCTTCTTC CTGGTGGACG ACGGCACACA CGGCTGCCTG GGGGGCGAGA   540
ACCGCTTCCG CTTGCGCCTG GAGTCCTACA TCTCACAGCA GAAGACGGGC GTGGGAGGGA   600
CTGGAATTGA CATCCCTGTC CTGCTCCTCC TGATTGATGG TGATGAGAAG ATGTTGACGC   660
GAATAGAGAA CGCCACCCAG GCTCAGCTCC CATGTCTCCT CGTGGCTGGC TCAGGGGGAG   720
CTGCGGACTG CCTGGCGGAG ACCCTGGAAG ACACTCTGGC CCCAGGGAGT GGGGGAGCCA   780
GGCAAGGCGA AGCCCGAGAT CGAATCAGGC GTTTCTTTCC CAAAGGGGAC CTTGAGGTCC   840
TGCAGGCCCA GGTGGAGAGG ATTATGACCC GGAAGGAGCT CCTGACAGTC TATTCTTCTG   900
AGGATGGGTC TGAGGAATTC GAGACCATAG TTTTGAAGGC CCTTGTGAAG GCCTGTGGGA   960
GCTCGGAGGC CTCAGCCTAC CTGGATGAGC TGCGTTTGGC TGTGGCTTGG AACCGCGTGG  1020
ACATTGCCCA GAGTGAACTC TTTCGGGGGG ACATCCAATG GCGGTCCTTC CATCTCGAAG  1080
CTTCCCTCAT GGACGCCCTG CTGAATGACC GGCCTGAGTT CGTGCGCTTG CTCATTTCCC  1140
ACGGCCTCAG CCTGGGCCAC TTCCTGACCC CGATGCGCCT GGCCCAACTC TACAGCGCGG  1200
CGCCCTCCAA CTCGCTCATC CGCAACCTTT TGGACCAGGC GTCCCACAGC GCAGGCACCA  1260
AAGCCCCAGC CCTAAAAGGG GGAGCTGCGG AGCTCCGGCC CCCTGACGTG GGGCATGTGC  1320
TGAGGATGCT GCTGGGGAAG ATGTGCGCGC CGAGGTACCC CTCCGGGGGC GCCTGGGACC  1380
CTCACCCAGG CCAGGGCTTC GGGGAGAGCA TGTATCTGCT CTCGGACAAG GCCACCTCGC  1440
CGCTCTCGCT GGATGCTGGC CTCGGGCAGG CCCCCTGGAG CGACCTGCTT CTTTGGGCAC  1500
TGTTGCTGAA CAGGGCACAG ATGGCCATGT ACTTCTGGGA GATGGGTTCC AATGCAGTTT  1560
CCTCAGCTCT TGGGGCCTGT TTGCTGCTCC GGGTGATGGC ACGCCTGGAG CCTGACGCTG  1620
AGGAGGCAGC ACGGAGGAAA GACCTGGCGT TCAAGTTTGA GGGGATGGGC GTTGACCTCT  1680
TTGGCGAGTG CTATCGCAGC AGTGAGGTGA GGGCTGCCCG CCTCCTCCTC CGTCGCTGCC  1740
CGCTCTGGGG GGATGCCACT TGCCTCCAGC TGGCCATGCA AGCTGACGCC CGTGCCTTCT  1800
TTGCCCAGGA TGGGGTACAG TCTCTGCTGA CACAGAAGTG GTGGGGAGAT ATGGCCAGCA  1860
CTACACCCAT CTGGGCCCTG GTTCTCGCCT TCTTTTGCCC TCCACTCATC TACACCCGCC  1920
TCATCACCTT CAGGAAATCA GAAGAGGAGC CCACACGGGA GGAGCTAGAG TTTGACATGG  1980
ATAGTGTCAT TAATGGGGAA GGGCCTGTCG GGACGGCGGA CCCAGCCGAG AAGACGCCGC  2040
TGGGGGTCCC GCGCCAGTCG GGCCGTCCGG GTTGCTGCGG GGGCCGCTGC GGGGGGCGCC  2100
GGTGCCTACG CCGCTGGTTC CACTTCTGGG GCGCGCCGGT GACCATCTTC ATGGGCAACG  2160
TGGTCAGCTA CCTGCTGTTC TTGCTGCTTT TCTCGCGGGT GCTGCTCGTG GATTTCCAGC  2220
CGGCGCCGCC CGGCTCCCTG GAGCTGCTGC TCTATTTCTG GGCTTTCACG CTGCTGTGCG  2280
AGGAACTGCG CCAGGGCCTG AGCGGAGGCG GGGGCAGCCT CGCCAGCGGG GGCCCCGGGC  2340
CTGGCCATGC CTCACTGAGC CAGCGCCTGC GCCTCTACCT CGCCGACAGC TGGAACCAGT  2400
GCGACCTAGT GGCTCTCACC TGCTTCCTCC TGGGCGTGGG CTGCCGGCTG ACCCCGGGTT  2460
TGTACCACCT GGGCCGCACT GTCCTCTGCA TCGACTTCAT GGTTTTCACG GTGCGGCTGC  2520
TTCACATCTT CACGGTCAAC AAACAGCTGG GGCCCAAGAT CGTCATCGTG AGCAAGATGA  2580
TGAAGGACGT GTTCTTCTTC CTCTTCTTCC TCGGCGTGTG GCTGGTAGCC TATGGCGTGG  2640
CCACGGAGGG GCTCCTGAGG CCACGGGACA GTGACTTCCC AAGTATCCTG CGCCGCGTCT  2700
TCTACCGTCC CTACCTGCAG ATCTTCGGGC AGATTCCCCA GGAGGACATG GACGTGGCCC  2760
TCATGGAGCA CAGCAACTGC TCGTCGGAGC CCGGCTTCTG GGCACACCCT CCTGGGGCCC  2820
AGGCGGGCAC CTGCGTCTCC CAGTATGCCA ACTGGCTGGT GGTGCTGCTC CTCGTCATCT  2880
TCCTGCTCGT GGCCAACATC CTGCTGGTCA ACTTGCTCAT TGCCATGTTC AGTTACACAT  2940
TCGGCAAAGT ACAGGGCAAC AGCGATCTCT ACTGGAAGGC GCAGCGTTAC CGCCTCATCC  3000
GGGAATTCCA CTCTCGGCCC GCGCTGGCCC CGCCCTTTAT CGTCATCTCC CACTTGCGCC  3060
TCCTGCTCAG GCAATTGTGC AGGCGACCCC GGAGCCCCCA GCCGTCCTCC CCGGCCCTCG  3120
AGCATTTCCG GGTTTACCTT TCTAAGGAAG CCGAGCGGAA GCTGCTAACG TGGGAATCGG  3180
```

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TGCATAAGGA GAACTTTCTG CTGGCACGCG CTAGGGACAA GCGGGAGAGC GACTCCGAGC  3240
GTCTGGAGCG CACGTCCCAG AAGGTGGACT TGGCACTGAA ACAGCTGGGA CACATCCGCG  3300
AGTACGAACA GCGCCTGAAA GTGCTGGAGC GGGAGGTCCA GCAGTGTAGC CGCGTCCTGG  3360
GGTGGGTGAC GTAGGCCGTT AGCAGCTCTG CCATGTTGCC CTCAGGTGGG CCGCCACCCC  3420
TTGACCTGCA TGGGTCCAAA GAGTGAGCCA TGCTGGCGGA TTTTAAGGAG AAGCCCCCAC  3480
AGGGGATTTT GCTCTTAGAG TAAGGCTCAT GTGGGCCTCG GCCCCCGCAC CTGGTGGCCT  3540
TGTCCTTGAG GTGAGCCCCA TGTCCATCTG GGCCACTGTC AGGACCACCT TTGGGAGTGT  3600
CATCCTTACA AACCACAGCA TGCCCGGCTC CTCCCAGAAC CAGTCCCAGC CTGGGAGGAT  3660
CAAGGCCTGG ATCCCGGGCC GTTATCCATC TGGAGGCTGC AGGGTCCTTG GGGTAACAGG  3720
GACCACAGAC CCCTCACCAC TCACAGATTC CTCACACTGG GGAAATAAAG CCATTTCAGA  3780
GGAAAAAAAA AAAAAAAAAA AAAAAAAAAA
```

SEQ ID NO:106 PEU5 Protein sequence
Protein Accession #: NP_060106

```
1          11         21         31         41         51
|          |          |          |          |          |
MASTGGTKVV AMGVAPWGVV RNRDTLINPK GSFPARYRWR GDPEDGVQFP LDYNYSAFFL    60
VDDGTHGCLG GENRFRLRLE SYISQQKTGV GGTGIDIPVL LLLIDGDEKM LTRIENATQA   120
QLPCLLVAGS GGAADCLAET LEDTLAPGSG GARQGEARDR IRRFFPKGDL EVLQAQVERI   180
MTRKELLTVY SSEDGSEEFE TIVLKALVKA CGSSEASAYL DELRLAVAWN RVDIAQSELF   240
RGDIQWRSFH LEASLMDALL NDRPEFVRLL ISHGLSLGHF LTPMRLAQLY SAAPSNSLIR   300
NLLDQASHSA GTKAPALKGG AAELRPPDVG HVLRMLLGKM CAPRYPSGGA WDPHPGQGFG   360
ESMYLLSDKA TSPLSLDAGL GQAPWSDLLL WALLLNRAQM AMYFWEMGSN AVSSALGACL   420
LLRVMARLEP DAEEAARRKD LAFKFEGMGV DLFGECYRSS EVRAARLLLR RCPLWGDATC   480
LQLAMQADAR AFFAQDGVQS LLTQKWWGDM ASTTPIWALV LAFFCPPLIY TRLITFRKSE   540
EEPTREELEF DMDSVINGEG PVGTADPAEK TPLGVPRQSG RPGCCGGRCG GRRCLRRWFH   600
FWGAPVTIFM GNVVSYLLFL LLFSRVLLVD FQPAPPGSLE LLLYFWAFTL LCEELRQGLS   660
GGGGSLASGG PGPGHASLSQ RLRLYLADSW NQCDLVALTC FLLGVGCRLT PGLYHLGRTV   720
LCIDFMVFTV RLLHIFTVNK QLGPKIVIVS KMMKDVFFFL FFLGVWLVAY GVATEGLLRP   780
RDSDFPSILR RVFYRPYLQI FGQIPQEDMD VALMEHSNCS SEPGFWAHPP GAQAGTCVSQ   840
YANWLVVLLL VIFLLVANIL LVNLLIAMFS YTFGKVQGNS DLYWKAQRYR LIREFHSRPA   900
LAPPFIVISH LRLLLRQLCR RPRSPQPSSP ALEHFRVYLS KEAERKLLTW ESVHKENFLL   960
ARARDKRESD SERLERTSQK VDLALKQLGH IREYEQRLKV LEREVQQCSR VLGWVT
```

SEQ ID NO:107 PEW3 DNA SEQUENCE

Nucleic Acid Accession #: NM_005982
Coding sequence: 276-1130 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
|          |          |          |          |          |
GGTAGCAGCA TCCACCGGGC GGGAGGTCGG AGGCAGCAAG GCCTTAAAGG CTACTGAGTG    60
CGCCGGCCGT TCCGTGTCCA GAACCTCCCC TACTCCTCCG CCTTCTCTTC CTTGGCCGCC   120
CACCGCCAAG TTCCGACTCC GGTTTTCGCC TTTGCAAAGC CTAAGGAGGA GGTTAGGAAC   180
AGCCGCGCCC CCCTCCCTGC GGCCGCCGCC CCCTGCCTCT CGGCTCTGCT CCCTGCCGCG   240
TGCGCCTGGG CCGTGCGCCC CGGCAGGCGC CAGCCATGTC GATGCTGCCG TCGTTTGGCT   300
TTACGCAGGA GCAAGTGGCG TGCGTGTGCG AGGTTCTGCA GCAAGGCGGA AACCTGGAGC   360
GCCTGGGCAG GTTCCTGTGG TCACTGCCCG CCTGCGACCA CCTGCACAAG AACGAGAGCG   420
TACTCAAGGC CAAGGCGGTG GTCGCCTTCC ACCGCGGCAA CTTCCGTGAG CTCTACAAGA   480
TCCTGGAGAG CCACCAGTTC TCGCCTCACA ACCACCCCAA ACTGCAGCAA CTGTGGCTGA   540
AGGCGCATTA CGTGGAGGCC GAGAAGCTGC GCGGCCGACC CCTGGGCGCC GTGGGCAAAT   600
ATCGGGTGCG CCGAAAATTT CCACTGCCGC GCACCATCTG GGACGGCGAG GAGACCAGCT   660
ACTGCTTCAA GGAGAAGTCG AGGGGTGTCC TGCGGGAGTG GTACGCGCAC AATCCCTACC   720
CATCGCCGCG TGAGAAGCGG GAGCTGGCCG AGGCCACCGG CCTCACCACC ACCCAGGTCA   780
GCAACTGGTT TAAGAACCGG AGGCAAAGAG ACCGGGCCGC GGAGGCCAAG GAAAGGGAGA   840
ACACCGAAAA CAATAACTCC TCCTCCAACA AGCAGAACCA ACTCTCTCCT CTGGAAGGGG   900
GCAAGCCGCT CATGTCCAGC TCAGAAGAGG AATTCTCACC TCCCCAAAGT CCAGACCAGA   960
ACTCGGTCCT TCTGCTGCAG GGCAATATGG GCCACGCCAG GAGCTCAAAC TATTCTCTCC  1020
CGGGCTTAAC AGCCTCGCAG CCCAGTCACG GCCTGCAGAC CCACCAGCAT CAGCTCCAAG  1080
ACTCTCTGCT CGGCCCCCTC ACCTCCAGTC TGGTGGACTT GGGGTCCTAA GTGGGGAGGG  1140
ACTGGGGCCT CGAAGGGATT CCTGGAGCAG CAACCACTGC AGCGACTAGG GACACTTGTA  1200
AATAGAAATC AGGAACATTT TTGCAGCTTG TTTCTGGAGT TGTTTGCGCA TAAAGGAATG  1260
GTGGACTTTC ACAAATATCT TTTTAAAAAT CAAAACCAAC AGCGATCTCA AGCTTAATCT  1320
CCTCTTCTCT CCAACTCTTT CCACTTTTGC ATTTTCCTTC CCAATGCAGA GATCAGGG
```

SEQ ID NO:108 PEW3 Protein sequence
Protein Accession #: NP_005973

```
1          11         21         31         41         51
|          |          |          |          |          |
MSMLPSFGFT QEQVACVCEV LQQGGNLERL GRFLWSLPAC DHLHKNESVL KAKAVVAFHR    60
GNFRELYKIL ESHQFSPHNH PKLQQLWLKA HYVEAEKLRG RPLGAVGKYR VRRKFPLPRT   120
IWDGEETSYC FKEKSRGVLR EWYAHNPYPS PREKRELAEA TGLTTTQVSN WFKNRRQRDR   180
AAEAKERENT ENNNSSSNKQ NQLSPLEGGK PLMSSSEEEF SPPQSPDQNS VLLLQGNMGH   240
ARSSNYSLPG LTASQPSHGL QTHQHQLQDS LLGPLTSSLV DLGS
```

SEQ ID NO:109 PFJ8 DNA SEQUENCE

Nucleic Acid Accession #: NM_005069
Coding sequence: 57-2060 (underlined sequences correspond to start and stop codons)

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1         11        21        31        41        51
|         |         |         |         |         |
GGGGCTCCGC GGGCCTGGAG CACGGCCGGG TCTAATATGC CCGGAGCCGA GGCGCGATGA  60
AGGAGAAGTC CAAGAATGCG GCCAAGACCA GGAGGGAGAA GGAAAATGGC GAGTTTTACG  120
AGCTTGCCAA GCTGCTCCCG CTGCCGTCGG CCATCACTTC GCAGCTGGAC AAAGCGTCCA  180
TCATCCGCCT CACCACGAGC TACCTGAAGA TGCGCGCCGT CTTCCCCGAA GGTTTAGGAG  240
ACGCGTGGGG ACAGCCGAGC CGCGCCGGGC CCCTGGACGG CGTCGCCAAG GAGCTGGGAT  300
CGCACTTGCT GCAGACTTTG GATGGATTTG TTTTTGTGGT AGCATCTGAT GGCAAAATCA  360
TGTATATATC CGAGACCGCT TCTGTCCATT TAGGCTTATC CCAGGTGGAG CTCACGGGCA  420
ACAGTATTTA TGAATACATC CATCCTTCTG ACCACGATGA GATGACCGCT GTCCTCACGG  480
CCCACCAGCC GCTGCACCAC CACCTGCTCC AAGAGTATGA GATAGAGAGG TCGTTCTTTC  540
TTCGAATGAA ATGTGTCTTG GCGAAAAGGA ACGCGGGCCT GACCTGCAGC GGATACAAGG  600
TCATCCACTG CAGTGGCTAC TTGAAGATCA GGCAGTATAT GCTGGACATG TCCCTGTACG  660
ACTCCTGCTA CCAGATTGTG GGGCTGGTGG CCGTGGGCCA GTCGCTGCCA CCCAGTGCCA  720
TCACCGAGAT CAAGCTGTAC AGTAACATGT TCATGTTCAG GGCCAGCCTT GACCTGAAGC  780
TGATATTCCT GGATTCCAGG GTGACCGAGG TGACGGGTTA CGAGCCGCAG GACCTGATCG  840
AGAAGACCCT ATACCATCAC GTGCACGGCT GCGACGTGTT CCACCTCCGC TACGCACACC  900
ACCTCCTGTT GGTGAAGGGC CAGGTCACCA CCAAGTACTA CCGGCTGCTG TCCAAGCGGG  960
GCGGCTGGGT GTGGGTGCAG AGCTACGCCA CCGTGGTGCA CAACAGCCGC TCGTCCCGGC  1020
CCCACTGCAT CGTGAGTGTC AATTATGTAC TCACGGAGAT TGAATACAAG GAACTTCAGC  1080
TGTCCCTGGA GCAGGTGTCC ACTGCCAAGT CCCAGGACTC CTGGAGGACC GCCTTGTCTA  1140
CCTCACAAGA AACTAGGAAA TTAGTGAAAC CCAAAAATAC CAAGATGAAG ACAAAGCTGA  1200
GAACAAACCC TTACCCCCCA CAGCAATACA GCTCGTTCCA AATGGACAAA CTGGAATGCG  1260
GCCAGCTCGG AAACTGGAGA GCCAGTCCCC CTGCAAGCGC TGCTGCTCCT CCAGAACTGC  1320
AGCCCCACTC AGAAAGCAGT GACCTTCTGT ACACGCCATC CTACAGCCTG CCCTTCTCCT  1380
ACCATTACGG ACACTTCCCT CTGGACTCTC ACGTCTTCAG CAGCAAAAAG CCAATGTTGC  1440
CGGCCAAGTT CGGGCAGCCC CAAGGATCCC CTTGTGAGGT GGCACGCTTT TTCCTGAGCA  1500
CACTGCCAGC CAGCGGTGAA TGCCAGTGGC ATTATGCCAA CCCCCTAGTG CCTAGCAGCT  1560
CGTCTCCAGC TAAAAATCCT CCAGAGCCAC CGGCGAACAC TGCTAGGCAC AGCCTGGTGC  1620
CAAGCTACGA AGCGCCCGCC GCCGCCGTGC GCAGGTTCGG CGAGGACACC GCGCCCCCGA  1680
GCTTCCCGAG CTGCGGCCAC TACCGCGAGG AGCCCGCGCT GGGCCCGGCC AAAGCCGCCC  1740
GCCAGGCCGC CCGGGACGGG GCGCGGCTGG CGCTGGCCCG CGCGGCACCC GAGTGCTGCG  1800
CGCCCCCGAC CCCCGAGGCC CCGGGCGCGC CGGCGCAGCT GCCCTTCGTG CTGCTCAACT  1860
ACCACCGCGT GCTGGCCCGG CGCGGACCGC TGGGGGGCGC CGCACCCGCC GCCTCCGGCC  1920
TGGCCTGCGC TCCCGGCGGC CCCGAGGCGG CGACCGGCGC GCTGCGGCTC CGGCACCCGA  1980
GCCCCGCCGC CACCTCCCCG CCCGGCGCGC CCCTGCCGCA CTACCTGGGC GCCTCGGTCA  2040
TCATCACCAA CGGGAGGTGA CCCGCTGGCC GCCCGCGCCA GGAGCCTGGA CCCGGCCTCC  2100
CGGGGCTGCG GCGCCACCGA GCCCGGCAAA TGCGCACGAC CTACATTAAT TTATGCAGAG  2160
ACAGCTGTTT GAATTGGACC CCGCCGCCGA CTTGCGGATT TCCACCGCGG AGGCCCCGCG  2220
CGCCGGTGCC GAGGGCCGAG GAGCGCCCGG GTCCGGGCAG GTGACCGCCC GCCTCTGTCC  2280
TGCGAGGGCC GGTGCGACCC AGTTGCTGGG GGCTTGGTTT CCTCACCTTG AAATCGGGCT  2340
TCACGCGTCT TGCCTTGTCC CCAACGTTCC ACAACAGTCC CGCTGGGGGA TTGAAGCGGT  2400
TTCACTCCGC AAATATCCTC CACTTTCAGG AGGGAAAACC CACCCTACCA CAGTCCGCTC  2460
TTCCAAGTGG ACGGCAGACC TGGGAGGGGA CGCCTGTGTC ACGAGCCCTT TTAGATGCTT  2520
AGGTGAAGGC AGAAGTGATG ATTGTAAGTC CCATGAATAC ACAACTCCAC TGTCTTTAAA  2580
AGTCATTCAA GAGTCTCATT ATTTTTGTTT TTATTTAACC CTTTCTTCAA TACAAAAAGC  2640
CAACAAACCA AGACTAAGGG GGTGACCATG CAATTCCATT TTGTGTCTGT GAACATAGGT  2700
GTGCTTCCCA AATACATTAA CAAGCTCTTA CTTCCCCCTA ACCCCTATGA ACTCTTGATA  2760
ACACCAAGAG TAGCACCTTC AGAATATATT GAATAGGCAT TAAATGCAAA AATATATATG  2820
TAGCCAGACA GTTTATGAGA ATGACCCTGT CAAGCTTCAT TATTACGTGG CAAAATCCCT  2880
CTGGCCCACA CAGATCTGTA ATTCACTAGG CTCGTGTTTG CTACAAATAG TGCTAATAAA  2940
GTTAAATTGC ACGTGCAATA CGGAACACTG TCAATGGACT GCACCTTGTG AAGGAAAAAC  3000
ATGCTTAAGG GGGTGTAATG AAAATGATGT AGACATTTTA AGCATTTTCT ACACAGCGAG  3060
AAAACTTCGT AAGAACATGT TACGTGTGCA ACAGGTAAAC AGAAATCCTT TCATAAAGCA  3120
CCAGCAGTGT TTAAAAAATG AGCTTCCATT AATTTTTACT TTTTATGGGT TTTGCTTAAA  3180
GATCTCAACA TGGAAAAATC CTGTCATGGC TCTGAACTGC ACAATGCATT GAACCGCCGT  3240
CCTTCAATTT TCTTCACACT ATCAACACTG CAGCATTTTG CTGCTTTATC AAAATGGTTT  3300
ATTTTAGGAA ACTTTTTCCA CCTTTCTGAA TGGAAAGAGG TTTTCACAAA TGTTTTAAAC  3360
TCATCGTTCT AAAATCAAGT GCACCTACAC CAACTGCTCT CAAAATGTGA ACTGACTTTT  3420
TTTTTTTTTT TTTTGCCAAC CCTGTGTCAC TTAGTGAGGA CCTGACACAA TCCCTACAGG  3480
GTGTCTGTCA GTGGGCCTCA TGGTAAGAGT CACAATTTGC AAATTTAGGA CCGTGGGTCA  3540
TGCAGCGAAG GGGCTGGATG GTAGGAAGGG ATGTGCCCGC CTCTCCACGC ACTCAGCTAT  3600
ACCTCATTCA CAGCTCCTTG TGAGTGTGTG CACAGGAAAT AAGCCGAGGG TATTATTTTT  3660
TTATGTTCAT GAGTCTTGTA ATTAAACCGT GATTCTTGAA AGGTGTAGGT TTGATTACTA  3720
GGAGATACCA CCGACATTTT TCAATAAAGT ACTGCAAAAT GCTTTTGTGT CTACCTTGTT  3780
ATTAACTTTT GGGGCTGTAT TTAGTAAAAA TAAATCAAGG CTATCGGAGC AGTTCAATAA  3840
CAAAGGTTAC TGTTGAGAAA AAAGACCCTA TCATAGATTT ACAAG
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SEQ ID NO:110 PFJ8 Protein sequence:
Protein Accession #: NP_005060.1

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1         11        21        31        41        51
|         |         |         |         |         |
MKEKSKNAAK TRREKENGEF YELAKLLPLP SAITSQLDKA SIIRLTTSYL KMRAVFPEGL  60
GDAWGQPSRA GPLDGVAKEL GSHLLQTLDG FVFVVASDGK IMYISETASV HLGLSQVELT  120
GNSIYEYIHP SDHDEMTAVL TAHQPLHHHL LQEYEIERSF FLRMKCVLAK RNAGLTCSGY  180
KVIHCSGYLK IRQYMLDMSL YDSCYQIVGL VAVGQSLPPS AITEIKLYSN MFMFRASLDL  240
```

KLIFLDSRVT EVTGYEPQDL IEKTLYHHVH GCDVFHLRYA HHLLLVKGQV TTKYYRLLSK 300
RGGWVWVQSY ATVVHNSRSS RPHCIVSVNY VLTEIEYKEL QLSLEQVSTA KSQDSWRTAL 360
STSQETRKLV KPKNTKMKTK LRTNPYPPQQ YSSFQMDKLE CGQLGNWRAS PPASAAAPPE 420
LQPHSESSDL LYTPSYSLPF SYHYGHFPLD SHVFSSKKPM LPAKFGQPQG SPCEVARFFL 480
STLPASGECQ WHYANPLVPS SSSPAKNPPE PPANTARHSL VPSYEAPAAA VRRFGEDTAP 540
PSFPSCGHYR EEPALGPAKA ARQAARDGAR LALARAAPEC CAPPTPEAPG APAQLPFVLL 600
NYHRVLARRG PLGGAAPAAS GLACAPGGPE AATGALRLRH PSPAATSPPG APLPHYLGAS 660
VIITNGR

SEQ ID NO:111 PFJ7 DNA SEQUENCE

Nucleic Acid Accession #: NM_006549
Coding sequence: 1-1254 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
| | | | | |
ATGAACGGAC GCTGCATCTG CCCGTCCCTG CCCTACTCAC CCGTCAGCTC CCCGCAGTCC 60
TCGCCTCGGC TGCCCCGGCG GCCGACAGTG GAGTCTCACC ACGTCTCCAT CACGGGTATG 120
CAGGACTGTG TGCAGCTGAA TCAGTATACC CTGAAGGATG AAATTGGAAA GGGCTCCTAT 180
GGTGTCGTCA AGTTGGCCTA CAATGAAAAT GACAATACCT ACTATGCAAT GAAGGTGCTG 240
TCCAAAAAGA AGCTGATCCG GCAGGCCGGC TTTCCACGTC GCCCTCCACC CCGAGGCACC 300
CGGCCAGCTC CTGGAGGCTG CATCCAGCCC AGGGGCCCCA TTGAGCAGGT GTACCAGGAA 360
ATTGCCATCC TCAAGAAGCT GGACCACCCC AATGTGGTGA AGCTGGTGGA GGTCCTGGAT 420
GACCCCAATG AGGACCATCT GTACATGGTG TTCGAACTGG TCAACCAAGG GCCCGTGATG 480
GAAGTGCCCA CCCTCAAACC ACTCTCTGAA GACCAGGCCC GTTTCTACTT CCAGGATCTG 540
ATCAAAGGCA TCGAGTACTT ACACTACCAG AAGATCATCC ACCGTGACAT CAAACCTTCC 600
AACCTCCTGG TCGGAGAAGA TGGGCACATC AAGATCGCTG ACTTTGGTGT GAGCAATGAA 660
TTCAAGGGCA GTGACGCGCT CCTCTCCAAC ACCGTGGGCA CGCCCGCCTT CATGGCACCC 720
GAGTCGCTCT CTGAGACCCG CAAGATCTTC TCTGGGAAGG CCTTGGATGT TTGGGCCATG 780
GGTGTGACAC TATACTGCTT TGTCTTTGGC CAGTGCCCAT TCATGGACGA GCGGATCATG 840
TGTTTACACA GTAAGATCAA GAGTCAGGCC CTGGAATTTC CAGACCAGCC CGACATAGCT 900
GAGGACTTGA AGGACCTGAT CACCCGTATG CTGGACAAGA ACCCCGAGTC GAGGATCGTG 960
GTGCCGGAAA TCAAGCTGCA CCCCTGGGTC ACGAGGCATG GGGCGGAGCC GTTGCCGTCG 1020
GAGGATGAGA ACTGCACGCT GGTCGAAGTG ACTGAAGAGG AGGTCGAGAA CTCAGTCAAA 1080
CACATTCCCA GCTTGGCAAC CGTGATCCTG GTGAAGACCA TGATACGTAA ACGCTCCTTT 1140
GGGAACCCAT TCGAGGGCAG CCGGCGGGAG GAACGCTCAC TGTCAGCGCC TGGAAACTTG 1200
CTCACCAAAA AACCAACCAG GGAATGTGAG TCCCTGTCTG AGCTCAAGAC CTAGAAAATA 1260
AGTCCCCTTC CTGCCTGTTG CAAAGTAACG TAAGAGTTCC CTCACCCGAG TGGATGCAGA 1320
CGTTCTTGCT GTCAGCCACC TTCCTTCATA CACATAGCCA GCCCAGGGTG ACCAGAACGT 1380
CCCAGGACAG ATGAGGCTTT GTGTCCTTAT GAGAGTGGGA GAACCTGGTG GGCACCCCTG 1440
GTGCAGGTGC TGTGGTGGGT GGGGACCCCA CTGCCTTTCC CACTGAGCAC ATCATGGCTA 1500
CCTGACTTGG TGGGAGTTCC ATTCAGTCAC TTCTGTTTCT TAAACATAGC TTTACTGAGG 1560
TACAATTCAC ATACCATGTA ATTCACCCAC GGGAAGTGTA TGATTCAGTG GTTTCTAATA 1620
CACACTTCTG CAGCCATTAC CACCGTCAAC TTTACGACAT TTTCATCAGC CCAAGAAGAC 1680
ACCCTACACT CCTTAGCTGT CCCCATCCAA CTCCCCCACC CCAGTAACCA CTCAGAATAG 1740
GTATGGATTT GCCTATTCTG GACGTTTCGT ATAAATGGCG TCATACACTA AAAAAAAAAA 1800
AAAA

SEQ ID NO:112 PFJ7 Protein sequence:
Protein Accession #: NP_006540.1

1 11 21 31 41 51
| | | | | |
MNGRCICPSL PYSPVSSPQS SPRLPRRPTV ESHHVSITGM QDCVQLNQYT LKDEIGKGSY 60
GVVKLAYNEN DNTYYAMKVL SKKKLIRQAG FPRRPPPRGT RPAPGGCIQP RGPIEQVYQE 120
IAILKKLDHP NVVKLVEVLD DPNEDHLYMV FELVNQGPVM EVPTLKPLSE DQARFYFQDL 180
IKGIEYLHYQ KIIHRDIKPS NLLVGEDGHI KIADFGVSNE FKGSDALLSN TVGTPAFMAP 240
ESLSETRKIF SGKALDVWAM GVTLYCFVFG QCPFMDERIM CLHSKIKSQA LEFPDQPDIA 300
EDLKDLITRM LDKNPESRIV VPEIKLHPWV TRHGAEPLPS EDENCTLVEV TEEEVENSVK 360
HIPSLATVIL VKTMIRKRSF GNPFEGSRRE ERSLSAPGNL LTKKPTRECE SLSELKT

SEQ ID NO:113 PFJ6 DNA SEQUENCE

Nucleic Acid Accession #: NM_021810
Coding sequence: 1-429 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
| | | | | |
ATGAAACCTC TGATATGGAC ATGGTCAGAT GTTGAAGGCC AGAGGCCGGC TCTGCTCATC 60
TGCACAGCTG CAGCAGGACC CACGCAGGGA GTTAAGGGTT ATGGCAAGCC CTTTGAGCCA 120
AGAAGTGTGA AAAACATACA CTCTACTCCT GCTTACCCAG ATGCCACAAT GCACAGACAA 180
CTCCTGGCTC CGGTGGAAGG AAGGATGGCA GAGACATTGA ATCAGAAACT CCATGTTGCC 240
AATGTGCTGG AAGATGACCC CGGCTACCTA CCTCACGTCT ACAGCGAGGA AGGGGAGTGT 300
GGAGGGGCCC CATCCCTCAG CTCTCTGGCC AGCTTGGAAC AGGAGTTGCA ACCTGATTTG 360

CTGGACTCTT TGGGTTCAAA AGCGACTCCG TTTGAGGAAA TATATTCAGA GTCAGGTGTT 420
CCTTCCTAA

SEQ ID NO:114 PFJ6 Protein sequence:
Protein Accession #: NP_068582.1

1 11 21 31 41 51
| | | | | |
MKPLIWTWSD VEGQRPALLI CTAAAGPTQG VKGYGKPFEP RSVKNIHSTP AYPDATMHRQ 60
LLAPVEGRMA ETLNQKLHVA NVLEDDPGYL PHVYSEEGEC GGAPSLSSLA SLEQELQPDL 120
LDSLGSKATP FEEIYSESGV PS

SEQ ID NO:115 PFJ5 DNA SEQUENCE

Nucleic Acid Accession #: NM_006361
Coding sequence: 131-985 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
| | | | | |
CGAATGCAGG CGACTTGCGA GCTGGGAGCG ATTTAAAACG CTTTGGATTC CCCCGGCCTG 60
GGTGGGGAGA GCGAGCTGGG TGCCCCCTAG ATTCCCCGCC CCCGCACCTC ATGAGCCGAC 120
CCTCGGCTCC ATGGAGCCCG GCAATTATGC CACCTTGGAT GGAGCCAAGG ATATCGAAGG 180
CTTGCTGGGA GCGGGAGGGG GGCGGAATCT GGTCGCCCAC TCCCCTCTGA CCAGCCACCC 240
AGCGGCGCCT ACGCTGATGC CTGCTGTCAA CTATGCCCCC TTGGATCTGC CAGGCTCGGC 300
GGAGCCGCCA AAGCAATGCC ACCCATGCCC TGGGGTGCCC CAGGGGACGT CCCCAGCTCC 360
CGTGCCTTAT GGTTACTTTG GAGGCGGGTA CTACTCCTGC CGAGTGTCCC GGAGCTCGCT 420
GAAACCCTGT GCCCAGGCAG CCACCCTGGC CGCGTACCCC GCGGAGACTC CCACGGCCGG 480
GGAAGAGTAC CCCAGTCGCC CCACTGAGTT TGCCTTCTAT CCGGGATATC CGGGAACCTA 540
CCACGCTATG GCCAGTTACC TGGACGTGTC TGTGGTGCAG ACTCTGGGTG CTCCTGGAGA 600
ACCGCGACAT GACTCCCTGT TGCCTGTGGA CAGTTACCAG TCTTGGGCTC TCGCTGGTGG 660
CTGGAACAGC CAGATGTGTT GCCAGGGAGA ACAGAACCCA CCAGGTCCCT TTTGGAAGGC 720
AGCATTTGCA GACTCCAGCG GGCAGCACCC TCCTGACGCC TGCGCCTTTC GTCGCGGCCG 780
CAAGAAACGC ATTCCGTACA GCAAGGGGCA GTTGCGGGAG CTGGAGCGGG AGTATGCGGC 840
TAACAAGTTC ATCACCAAGG ACAAGAGGCG CAAGATCTCG GCAGCCACCA GCCTCTCGGA 900
GCGCCAGATT ACCATCTGGT TTCAGAACCG CCGGGTCAAA GAGAAGAAGG TTCTCGCCAA 960
GGTGAAGAAC AGCGCTACCC CTTAAGAGAT CTCCTTGCCT GGGTGGGAGG AGCGAAAGTG 1020
GGGGTGTCCT GGGGAGACCA GAAACCTGCC AAGCCCAGGC TGGGGCCAAG GACTCTGCTG 1080
AGAGGCCCCT AGAGACAACA CCCTTCCCAG GCCACTGGCT GCTGGACTGT TCCTCAGGAG 1140
CGGCCTGGGT ACCCAGTATG TGCAGGGAGA CGGAACCCCA TGTGACAGGC CCACTCCACC 1200
AGGGTTCCCA AAGAACCTGG CCCAGTCATA ATCATTCATC CTCACAGTGG CAATAATCAC 1260
GATAACCAGT

SEQ ID NO:116 PFJ5 Protein sequence:
Protein Accession #: NP_006352.1

1 11 21 31 41 51
| | | | | |
MEPGNYATLD GAKDIEGLLG AGGGRNLVAH SPLTSHPAAP TLMPAVNYAP LDLPGSAEPP 60
KQCHPCPGVP QGTSPAPVPY GYFGGGYYSC RVSRSSLKPC AQAATLAAYP AETPTAGEEY 120
PSRPTEFAFY PGYPGTYHAM ASYLDVSVVQ TLGAPGEPRH DSLLPVDSYQ SWALAGGWNS 180
QMCCQGEQNP PGPFWKAAFA DSSGQHPPDA CAFRRGRKKR IPYSKGQLRE LEREYAANKF 240
ITKDKRRKIS AATSLSERQI TIWFQNRRVK EKKVLAKVKN SATP

SEQ ID NO:117 PFJ4 DNA SEQUENCE

Nucleic Acid Accession #: NM_005628
Coding sequence: 591-2216 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
| | | | | |
GTAACCGCTA CTCCCGGACA CCAGACCACC GCCTTCCGTA CACAGGGGCC CGCATCCCAC 60
CCTCCCGGAC CTAAGAGCCT GGGTCCCCTG TTTCCGGAGG TCCGCTTCCC GGCCCCCAGA 120
TTCTGGCATC CCAGCCCTCA GTGTCCAAGA CCCAGGCAGC CCGGGTCCCC GCCTCCCGGA 180
TCCAGGCGTC CGGGATCTGC GCCACCAGAA CCTAGCCTCC TGCAGACCTC CGCCATCTGG 240
GGGCACTCAA CCTCCTGGAG CCAAGGGCCC CACGTCCCAC CCAGAGAAAC TCTCGTATTC 300
CCAGCTCCTA GGGCCAAGGA ACCCGGGCGC TCCGAACTCC CAGCTTTCGG ACATCTGGCA 360
CACGGGGCAG AGCAGAGAAG CTCAGCGCCC AGCCTGGGGA ATTTAAACAC TCCAGCTTCC 420
AAGAGCCAAG GAACTTCAGT GCTGTGAACT CACAACTCTA AGGAGCCCTC CAAAGTTCCA 480
GTCTCCAGGT GCTGTTACTC AACTCAGTCC TAGGAACGTC GGGTCCTGGG AAGGAGCCCA 540
AGCGCTCCCA GCCAGCTTCC AGGCGCTAAG AAACCCCGGT GCTTCCCATC ATGGTGGCCG 600
ATCCTCCTCG AGACTCCAAG GGGCTCGCAG CGGCGGAGCC CACCGCCAAC GGGGGCCTGG 660
CGCTGGCCTC CATCGAGGAC CAAGGCGCGG CAGCAGGCGG CTACTGCGGT TCCCGGGACC 720
AGGTGCGCCG CTGCCTTCGA GCCAACCTGC TTGTGCTGCT GACAGTGGTG GCCGTGGTGG 780
CCGGCGTGGC GCTGGGACTG GGGGTGTCGG GGGCCGGGGG TGCGCTGGCG TTGGGCCCGG 840

AGCGCTTGAG CGCCTTCGTC TTCCCGGGCG AGCTGCTGCT GCGTCTGCTG CGGATGATCA 900
TCTTGCCGCT GGTGGTGTGC AGCTTGATCG GCGGCGCCGC CAGCCTGGAC CCCGGCGCGC 960
TCGGCCGTCT GGGCGCCTGG GCGCTGCTCT TTTTCCTGGT CACCACGCTG CTGGCGTCGG 1020
CGCTCGGAGT GGGCTTGGCG CTGGCTCTGC AGCCGGGCGC CGCCTCCGCC GCCATCAACG 1080
CCTCCGTGGG AGCCGCGGGC AGTGCCGAAA ATGCCCCCAG CAAGGAGGTG CTCGATTCGT 1140
TCCTGGATCT TGCGAGAAAT ATCTTCCCTT CCAACCTGGT GTCAGCAGCC TTTCGCTCAT 1200
ACTCTACCAC CTATGAAGAG AGGAATATCA CCGGAACCAG GGTGAAGGTG CCCGTGGGGC 1260
AGGAGGTGGA GGGGATGAAC ATCCTGGGCT TGGTAGTGTT TGCCATCGTC TTTGGTGTGG 1320
CGCTGCGGAA GCTGGGGCCT GAAGGGGAGC TGCTTATCCG CTTCTTCAAC TCCTTCAATG 1380
AGGCCACCAT GGTTCTGGTC TCCTGGATCA TGTGGTACGC CCCTGTGGGC ATCATGTTCC 1440
TGGTGGCTGG CAAGATCGTG GAGATGGAGG ATGTGGGTTT ACTCTTTGCC CGCCTTGGCA 1500
AGTACATTCT GTGCTGCCTG CTGGGTCACG CCATCCATGG GCTCCTGGTA CTGCCCCTCA 1560
TCTACTTCCT CTTCACCCGC AAAAACCCCT ACCGCTTCCT GTGGGGCATC GTGACGCCGC 1620
TGGCCACTGC CTTTGGGACC TCTTCCAGTT CCGCCACGCT GCCGCTGATG ATGAAGTGCG 1680
TGGAGGAGAA TAATGGCGTG GCCAAGCACA TCAGCCGTTT CATCCTGCCC ATCGGCGCCA 1740
CCGTCAACAT GGACGGTGCC GCGCTCTTCC AGTGCGTGGC CGCAGTGTTC ATTGCACAGC 1800
TCAGCCAGCA GTCCTTGGAC TTCGTAAAGA TCATCACCAT CCTGGTCACG GCCACAGCGT 1860
CCAGCGTGGG GGCAGCGGGC ATCCCTGCTG GAGGTGTCCT CACTCTGGCC ATCATCCTCG 1920
AAGCAGTCAA CCTCCCGGTC GACCATATCT CCTTGATCCT GGCTGTGGAC TGGCTAGTCG 1980
ACCGGTCCTG TACCGTCCTC AATGTAGAAG GTGACGCTCT GGGGGCAGGA CTCCTCCAAA 2040
ATTATGTGGA CCGTACGGAG TCGAGAAGCA CAGAGCCTGA GTTGATACAA GTGAAGAGTG 2100
AGCTGCCCCT GGATCCGCTG CCAGTCCCCA CTGAGGAAGG AAACCCCCTC CTCAAACACT 2160
ATCGGGGGCC CGCAGGGGAT GCCACGGTCG CCTCTGAGAA GGAATCAGTC ATGTAAACCC 2220
CGGGAGGGAC CTTCCCTGCC CTGCTGGGGG TGCTCTTTGG ACACTGGATT ATGAGGAATG 2280
GATAAATGGA TGAGCTAGGG CTCTGGGGGT CTGCCTGCAC ACTCTGGGGA GCCAGGGGCC 2340
CCAGCACCCT CCAGGACAGG AGATCTGGGA TGCCTGGCTG CTGGAGTACA TGTGTTCACA 2400
AGGGTTACTC CTCAAAACCC CCAGTTCTCA CTCATGTCCC CAACTCAAGG CTAGAAAACA 2460
GCAAGATGGA GAAATAATGT TCTGCTGCGT CCCCACCGTG ACCTGCCTGG CCTCCCCTGT 2520
CTCAGGGAGC AGGTCACAGG TCACCATGGG GAATTCTAGC CCCCACTGGG GGGATGTTAC 2580
AACACCATGC TGGTTATTTT GGCGGCTGTA GTTGTGGGGG GATGTGTGTG TGCACGTGTG 2640
TGTGTGTGTG TGTGTGTGTG TGTGTGTGTG TTCTGTGACC TCCTGTCCCC ATGGTACGTC 2700
CCACCCTGTC CCCAGATCCC CTATTCCCTC CACAATAACA GAAACACTCC CAGGGACTCT 2760
GGGGAGAGGC TGAGGACAAA TACCTGCTGT CACTCCAGAG GACATTTTTT TTAGCAATAA 2820
AATTGAGTGT CAACTATTTA AAAAAAAAAA AAAAAA

SEQ ID NO:118 PFJ4 Protein sequence:
Protein Accession #: NP_005619.1

1 11 21 31 41 51
| | | | | |
MVADPPRDSK GLAAAEPTAN GGLALASIED QGAAAGGYCG SRDQVRRCLR ANLLVLLTVV 60
AVVAGVALGL GVSGAGGALA LGPERLSAFV FPGELLLRLL RMIILPLVVC SLIGGAASLD 120
PGALGRLGAW ALLFFLVTTL LASALGVGLA LALQPGAASA AINASVGAAG SAENAPSKEV 180
LDSFLDLARN IFPSNLVSAA FRSYSTTYEE RNITGTRVKV PVGQEVEGMN ILGLVVFAIV 240
FGVALRKLGP EGELLIRFFN SFNEATMVLV SWIMWYAPVG IMFLVAGKIV EMEDVGLLFA 300
RLGKYILCCL LGHAIHGLLV LPLIYFLFTR KNPYRFLWGI VTPLATAFGT SSSSATLPLM 360
MKCVEENNGV AKHISRFILP IGATVNMDGA ALFQCVAAVF IAQLSQQSLD FVKIITILVT 420
ATASSVGAAG IPAGGVLTLA IILEAVNLPV DHISLILAVD WLVDRSCTVL NVEGDALGAG 480
LLQNYVDRTE SRSTEPELIQ VKSELPLDPL PVPTEEGNPL LKHYRGPAGD ATVASEKESV 540
M

SEQ ID NO:119 PFJ3 DNA SEQUENCE

Nucleic Acid Accession #: NM_006708
Coding sequence: 88-642 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
| | | | | |
CTAGTTAAGG CGGCACAGGG CCGAGGCGTA GTGTGGGTGA CTCCTCCGTT CCTTGGGTCC 60
CGTCGTCTGT GATACTGCAG TTCAGCCATG GCAGAACCGC AGCCCCCGTC CGGCGGCCTC 120
ACGGACGAGG CCGCCCTCAG TTGCTGCTCC GACGCGGACC CCAGTACCAA GGATTTTCTA 180
TTGCAGCAGA CCATGCTACG AGTGAAGGAT CCTAAGAAGT CACTGGATTT TTATACTAGA 240
GTTCTTGGAA TGACGCTAAT CCAAAAATGT GATTTTCCCA TTATGAAGTT TTCACTCTAC 300
TTCTTGGCTT ATGAGGATAA AAATGACATC CCTAAAGAAA AAGATGAAAA AATAGCCTGG 360
GCGCTCTCCA GAAAAGCTAC ACTTGAGCTG ACACACAATT GGGGCACTGA AGATGATGCG 420
ACCCAGAGTT ACCACAATGG CAATTCAGAC CCTCGAGGAT TCGGTCATAT TGGAATTGCT 480
GTTCCTGATG TATACAGTGC TTGTAAAAGG TTTGAAGAAC TGGGAGTCAA ATTTGTGAAG 540
AAACCTGATG ATGGTAAAAT GAAAGGCCTG GCATTTATTC AAGATCCTGA TGGCTACTGG 600
ATTGAAATTT TGAATCCTAA CAAAATGGCA ACCTTAATGT AGTGCTGTGA GAATTCTCCT 660
TTGAGATTTC AGAAGAAAGG AAACAATGTG ATTCAAGATA TTTACATACC AGAAGCATCT 720
AGGACTGATG GATCACTGTC CCGATTCAAA TTATTCTTCA GTCCATTTCC CCTTCCTATT 780
TCAGCTGTTC CTTTTCACCT AACTGTTCAG TCATTCTGGT TTTCAAGCAG TGCTTTATCT 840
CATGTCCTTG AATATAGTTG TGTAACTTTA TTTTTTAGGT AATAATTAGA ACAGTTCCCT 900
TCAGAGGCTG CATTTGCCTT CTTCTGCCAC CTAAATATTA CTTCCCTTCA AATCTGCCTT 960
TGAATCATCA TTTTTAAAAA AAAATTAACA TGTTTTTGTT GTAGTTATCT TCTGGGGTTT 1020
CAATTCCTCA GAAACAACTT TTTTCACAAC GGAAAGGAAA GAACACTAGT GTTCTTTCAG 1080
TAAAGTACAA AGTGTTTATT TTACAAAAGA GTAGGTACTC TTGAGAGCAA TTCAAATCAT 1140

GCTGACAAGG ATACTGATAG AAAAAGTGAT TTCTTCTTAT TATAAAGTAC ATTTAAAGTT 1200
CAAGGACTAA CCTTATTTAT TTGGGAAAGG GGAGGAGGAA GGAAATGATA TGGTACCCAG 1260
ACACTGGGCT AGGCTGCAAC TTTATCTCAT TTAATACTCC CAGCTGTCAT GTGAGAAAGA 1320
AAGCAGGCTA GGCATGTGAA ATCACTTTCA TGGATTATTA ATGGATTTAA GAGGGCATCA 1380
ATCAGCTCAA CTCAAGATTT CATAATCATT TTTAGTATTT AGATTGTGCC TCAAAGTTGT 1440
AGTACCTCAC AATACCTCCA CTGGTTTCCT GTTGTAAAAA CCTTCAGTGA GTTTGACCAT 1500
TGTGCTCTTG GCTCTTGGGC TGGAGTACCG TGGTGAGGGA GTAAACACTA GAAGTCTTTA 1560
GTACAAAACT GCTCTAGGGA CACCTGGTGA TTCCTACACA AGTGATGTTT ATATTTCTCA 1620
TAAAGAGTCT TCCCTATCCC AAGGTCTTCA TGATGCCAGT AGCCATATAT GATAAATTAT 1680
GTTCAGTGAT AACTTAGTTA TCAGAAATCA GCTCAGTGGT CTTCCCCGCC ATGATTCACA 1740
TTTGATGAGT TTTTAAAAAT CAAAGTGATT TTGAAAATCT CTAATGGCTC AGAAAATAAA 1800
AACATCCAGT TTGTGGATGA CTATATTTAG ATTTCTCTAG ACTCTAGTGG AAGACCTTTG 1860
GAAAGGCCAT GCCAACCGTG CTTGTACTGC TAGAAGCACT TTATGTTTCC TTTTTGGGTG 1920
AAATGGATTT ATGTGAGTGC TTTAAACAAA TAGCAATACT TATAGACTGA AATAAAATGA 1980
AACTTCAAAT AAG

SEQ ID NO:120 PFJ3 Protein sequence:
Protein Accession #: NP_006699.1

1 11 21 31 41 51
| | | | | |
MAEPQPPSGG LTDEAALSCC SDADPSTKDF LLQQTMLRVK DPKKSLDFYT RVLGMTLIQK 60
CDFPIMKFSL YFLAYEDKND IPKEKDEKIA WALSRKATLE LTHNWGTEDD ATQSYHNGNS 120
DPRGFGHIGI AVPDVYSACK RFEELGVKFV KKPDDGKMKG LAFIQDPDGY WIEILNPNKM 180
ATLM

SEQ ID NO:121 PFJ2 DNA SEQUENCE
Nucleic Acid Accession #: NM_002867
Coding sequence: 70-729 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
| | | | | |
CCGACGCCAG GTCCTGCCGT CCCGCCGACC GTCCGGGAGC GAACCCGTCG TCCCGCACTG 60
GAGTCCGCGA TGGCTTCAGT GACAGATGGT AAACATGGAG TCAAAGATGC CTCTGACCAG 120
AATTTTGACT ACATGTTTAA ACTGCTTATC ATTGGCAACA GCAGTGTTGG CAAGACCTCC 180
TTCCTCTTGC GCTATGCTGA TGACACGTTC ACCCCAGCCT TCGTTAGCAC CGTGGGCATC 240
GACTTCAAGG TGAAGACAGT CTACCGTCAC GAGAAGCGGG TGAAACTGCA GATCTGGGAC 300
ACAGCTGGGC AGGAGCGGTA CCGGACCATC ACAACAGCCT ATTACCGTGG GGCCATGGGC 360
TTCATTCTGA TGTATGACAT CACCAATGAA GAGTCCTTCA ATGCTGTCCA AGACTGGGCT 420
ACTCAGATCA AGACCTACTC CTGGGACAAT GCACAAGTTA TTCTGGTGGG GAACAAGTGT 480
GACATGGAGG AAGAGAGGGT TGTTCCCACT GAGAAGGGCC AGCTCCTTGC AGAGCAGCTT 540
GGGTTTGATT TCTTTGAAGC CAGTGCAAAG GAGAACATCA GTGTAAGGCA GGCCTTTGAG 600
CGCCTGGTGG ATGCCATTTG TGACAAGATG TCTGATTCGC TGGACACAGA CCCGTCGATG 660
CTGGGCTCCT CCAAGAACAC GCGTCTCTCG GACACCCCAC CGCTGCTGCA GCAGAACTGC 720
TCATGCTAGC AAGGCCCACC TTCCTGACCT CCCCTCATTG TGGCCCCACA CCCAAGTCTG 780
CTTCTCCCTG TTACACACTG TCCGCTCT

SEQ ID NO:122 PFJ2 Protein sequence:
Protein Accession #: NP_002858.1

1 11 21 31 41 51
| | | | | |
MASVTDGKHG VKDASDQNFD YMFKLLIIGN SSVGKTSFLL RYADDTFTPA FVSTVGIDFK 60
VKTVYRHEKR VKLQIWDTAG QERYRTITTA YYRGAMGFIL MYDITNEESF NAVQDWATQI 120
KTYSWDNAQV ILVGNKCDME EERVVPTEKG QLLAEQLGFD FFEASAKENI SVRQAFERLV 180
DAICDKMSDS LDTDPSMLGS SKNTRLSDTP PLLQQNCSC

SEQ ID NO:123 PFJ1 DNA SEQUENCE
Nucleic Acid Accession #: NM_001844
Coding sequence: 158-4621 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
| | | | | |
ACGCAGAGCG CTGCTGGGCT GCCGGGTCTC CCGCTTCCTC CTCCTGCTCC AAGGGCCTCC 60
TGCATGAGGG CGCGGTAGAG ACCCGGACCC GCGCCGTGCT CCTGCCGTTT CGCTGCGCTC 120
CGCCCCGGGCC CGGCTCAGCC AGGCCCCGCG GTGAGCCATG ATTCGCCTCG GGGCTCCCCA 180
GTCGCTGGTG CTGCTGACGC TGCTCGTCGC CGCTGTCCTT CGGTGTCAGG GCCAGGATGT 240
CCAGGAGGCT GGCAGCTGTG TGCAGGATGG GCAGAGGTAT AATGATAAGG ATGTGTGGAA 300
GCCGGAGCCC TGCCGGATCT GTGTCTGTGA CACTGGGACT GTCCTCTGCG ACGACATAAT 360
CTGTGAAGAC GTGAAAGACT GCCTCAGCCC TGAGATCCCC TTCGGAGAGT GCTGCCCCAT 420
CTGCCCAACT GACCTCGCCA CTGCCAGTGG GCAACCAGGA CCAAAGGGAC AGAAAGGAGA 480
ACCTGGAGAC ATCAAGGATA TTGTAGGACC CAAAGGACCT CCTGGGCCTC AGGGACCTGC 540

AGGGGAACAA GGACCCAGAG GGGATCGTGG TGACAAAGGT GAAAAAGGTG CCCCTGGACC 600
TCGTGGCAGA GATGGAGAAC CTGGGACCCC TGGAAATCCT GGCCCCCCTG GTCCTCCCGG 660
CCCCCCTGGT CCCCCTGGTC TTGGTGGAAA CTTTGCTGCC CAGATGGCTG GAGGATTTGA 720
TGAAAAGGCT GGTGGCGCCC AGTTGGGAGT AATGCAAGGA CCAATGGGCC CCATGGGACC 780
TCGAGGACCT CCAGGCCCTG CAGGTGCTCC TGGGCCTCAA GGATTTCAAG GCAATCCTGG 840
TGAACCTGGT GAACCTGGTG TCTCTGGTCC CATGGGTCCC CGTGGTCCTC CTGGTCCCCC 900
TGGAAAGCCT GGTGATGATG GTGAAGCTGG AAAACCTGGA AAAGCTGGTG AAAGGGGTCC 960
GCCTGGTCCT CAGGGTGCTC GTGGTTTCCC AGGAACCCCA GGCCTTCCTG GTGTCAAAGG 1020
TCACAGAGGT TATCCAGGCC TGGACGGTGC TAAGGGAGAG GCGGGTGCTC CTGGTGTGAA 1080
GGGTGAGAGT GGTTCCCCGG GTGAGAACGG ATCTCCGGGC CCAATGGGTC CTCGTGGCCT 1140
GCCTGGTGAA AGAGGACGGA CTGGCCCTGC TGGCGCTGCG GGTGCCCGAG GCAACGATGG 1200
TCAGCCAGGC CCCGCAGGTC CTCCGGGTCC TGTCGGTCCT GCTGGTGGTC CTGGCTTCCC 1260
TGGTGCTCCT GGAGCCAAGG GTGAAGCCGG CCCCACTGGT GCCCGTGGTC CTGAAGGTGC 1320
TCAAGGTCCT CGCGGTGAAC CTGGTACTCC TGGGTCCCCT GGGCCTGCTG GTGCCTCCGG 1380
TAACCCTGGA ACAGATGGAA TTCCTGGAGC CAAAGGATCT GCTGGTGCTC CTGGCATTGC 1440
TGGTGCTCCT GGCTTCCCTG GGCCACGGGG TCCTCCTGGC CCTCAAGGTG CAACTGGTCC 1500
TCTGGGCCCG AAAGGTCAGA CGGGTGAACC TGGTATTGCT GGCTTCAAAG GTGAACAAGG 1560
CCCCAAGGGA GAACCTGGCC CTGCTGGCCC CCAGGGAGCC CCTGGACCCG CTGGTGAAGA 1620
AGGCAAGAGA GGTGCCCGTG GAGAGCCTGG TGGCGTTGGG CCCATCGGTC CCCCTGGAGA 1680
AAGAGGTGCT CCCGGAAACC GCGGTTTCCC AGGTCAAGAT GGTCTGGCAG GTCCCAAGGG 1740
AGCCCCTGGA GAGCGAGGGC CCAGTGGTCT TGCTGGCCCC AAGGGAGCCA ACGGTGACCC 1800
TGGCCGTCCT GGAGAACCTG GCCTTCCTGG AGCCCGGGGT CTCACTGGCC GCCCTGGTGA 1860
TGCTGGTCCT CAAGGCAAAG TTGGCCCTTC TGGAGCCCCT GGTGAAGATG GTCGTCCTGG 1920
ACCTCCAGGT CCTCAGGGGG CTCGTGGGCA GCCTGGTGTC ATGGGTTTCC CTGGCCCCAA 1980
AGGTGCCAAC GGTGAGCCTG GCAAAGCTGG TGAGAAGGGA CTGCCTGGTG CTCCTGGTCT 2040
GAGGGGTCTT CCTGGCAAAG ATGGTGAGAC AGGTGCTGCA GGACCCCCTG GCCCTGCTGG 2100
ACCTGCTGGT GAACGAGGCG AGCAGGGTGC TCCTGGGCCA TCTGGGTTCC AGGGACTTCC 2160
TGGCCCTCCT GGTCCCCCAG GTGAAGGTGG AAAACCAGGT GACCAGGGTG TTCCCGGTGA 2220
AGCTGGAGCC CCTGGCCTCG TGGGTCCCAG GGGTGAACGA GGTTTCCCAG GTGAACGTGG 2280
CTCTCCCGGT GCCCAGGGCC TCCAGGGTCC CCGTGGCCTC CCCGGCACTC CTGGCACTGA 2340
TGGTCCCAAA GGTGCATCTG GCCCAGCAGG CCCCCCTGGC GCACAGGGCC CTCCAGGTCT 2400
TCAGGGAATG CCTGGCGAGA GGGGAGCAGC TGGTATCGCT GGGCCCAAAG GCGACAGGGG 2460
TGACGTTGGT GAGAAAGGCC CTGAGGGAGC CCCTGGAAAG GATGGTGGAC GAGGCCTGAC 2520
AGGTCCCATT GGCCCCCCTG GCCCAGCTGG TGCTAACGGC GAGAAGGGAG AAGTTGGACC 2580
TCCTGGTCCT GCAGGAAGTG CTGGTGCTCG TGGCGCTCCG GGTGAACGTG GAGAGACTGG 2640
CCCCCCCGGA CCAGCGGGAT TTGCTGGGCC TCCTGGTGCT GATGGCCAGC CTGGGGCCAA 2700
GGGTGAGCAA GGAGAGGCCG GCCAGAAAGG CGATGCTGGT GCCCCTGGTC CTCAGGGCCC 2760
CTCTGGAGCA CCTGGGCCTC AGGGTCCTAC TGGAGTGACT GGTCCTAAAG GAGCCCGAGG 2820
TGCCCAAGGC CCCCCGGGAG CCACTGGATT CCCTGGAGCT GCTGGCCGCG TTGGACCCCC 2880
AGGCTCCAAT GGCAACCCTG GACCCCCTGG TCCCCCTGGT CCTTCTGGAA AAGATGGTCC 2940
CAAAGGTGCT CGAGGAGACA GCGGCCCCCC TGGCCGAGCT GGTGAACCCG GCCTCCAAGG 3000
TCCTGCTGGA CCCCCTGGCG AGAAGGGAGA GCCTGGAGAT GACGGTCCCT CTGGTGCCGA 3060
AGGTCCACCA GGTCCCCAGG GTCTGGCTGG TCAGAGAGGC ATCGTCGGTC TGCCTGGGCA 3120
ACGTGGTGAG AGAGGATTCC CTGGCTTGCC TGGCCCATCG GGTGAGCCCG GCAAGCAGGG 3180
TGCTCCTGGA GCATCTGGAG ACAGAGGTCC TCCTGGCCCC GTGGGTCCTC CTGGCCTGAC 3240
GGGTCCTGCA GGTGAACCCG GACGAGAGGG AAGCCCCGGT GCTGATGGCC CCCCTGGCAG 3300
AGATGGCGCT GCTGGAGTCA AGGGTGATCG TGGTGAGACT GGTGCTGTGG GAGCTCCTGG 3360
AGCCCCTGGG CCCCCTGGCT CCCCTGGCCC CGCTGGTCCA ACTGGCAAGC AAGGAGACAG 3420
AGGAGAAGCT GGTGCACAAG GCCCCATGGG ACCCTCAGGA CCAGCTGGAG CCCGGGGAAT 3480
CCAGGGTCCT CAAGGCCCCA GAGGTGACAA AGGAGAGGCT GGAGAGCCTG GCGAGAGAGG 3540
CCTGAAGGGA CACCGTGGCT TCACTGGTCT GCAGGGTCTG CCCGGCCCTC CTGGTCCTTC 3600
TGGAGACCAA GGTGCTTCTG GTCCTGCTGG TCCTTCTGGC CCTAGAGGTC CTCCTGGCCC 3660
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TCCCCGTGGA CGATCAGGCG AAACCGGTCC TGCTGGTCCT CCTGGAAATC CTGGGCCCCC 3780
TGGTCCTCCA GGTCCCCCTG GCCCTGGCAT CGACATGTCC GCCTTTGCTG GCTTAGGCCC 3840
GAGAGAGAAG GGCCCCGACC CCCTGCAGTA CATGCGGGCC GACCAGGCAG CCGGTGGCCT 3900
GAGACAGCAT GACGCCGAGG TGGATGCCAC ACTCAAGTCC CTCAACAACC AGATTGAGAG 3960
CATCCGCAGC CCCGAGGGCT CCCGCAAGAA CCCTGCTCGC ACCTGCAGAG ACCTGAAACT 4020
CTGCCACCCT GAGTGGAAGA GTGGAGACTA CTGGATTGAC CCCAACCAAG GCTGCACCTT 4080
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AGCAAACGTT CCCAAGAAGA ACTGGTGGAG CAGCAAGAGC AAGGAGAAGA AACACATCTG 4200
GTTTGGAGAA ACCATCAATG GTGGCTTCCA TTTCAGCTAT GGAGATGACA ATCTGGCTCC 4260
CAACACTGCC AACGTCCAGA TGACCTTCCT ACGCCTGCTG TCCACGGAAG GCTCCCAGAA 4320
CATCACCTAC CACTGCAAGA ACAGCATTGC CTATCTGGAC GAAGCAGCTG GCAACCTCAA 4380
GAAGGCCCTG CTCATCCAGG GCTCCAATGA CGTGGAGATC CGGGCAGAGG GCAATAGCAG 4440
GTTCACGTAC ACTGCCCTGA AGGATGGCTG CACGAAACAT ACCGGTAAGT GGGGCAAGAC 4500
TGTTATCGAG TACCGGTCAC AGAAGACCTC ACGCCTCCCC ATCATTGACA TTGCACCCAT 4560
GGACATAGGA GGGCCCGAGC AGGAATTCGG TGTGGACATA GGGCCGGTCT GCTTCTTGTA 4620
AAAACCTGAA CCCAGAAACA ACACAATCCG TTGCAAACCC AAAGGACCCA AGTACTTTCC 4680
AATCTCAGTC ACTCTAGGAC TCTGCACTGA ATGGCTGACC TGACCTGATG TCCATTCATC 4740
CCACCCTCTC ACAGTTCGGA CTTTTCTCCC CTCTCTTTCT AAGAGACCTG AACTGGGCAG 4800
ACTGCAAAAT AAAATCTCGG TGTTCTATTT ATTTATTGTC TTCCTGTAAG ACCTTCGGGT 4860
CAAGGCAGAG GCAGGAAACT AACTGGTGTG AGTCAAATGC CCCCTGAGTG ACTGCCCCCA 4920
GCCCAGGCCA GAAGACCTCC CTTCAGGTGC CGGGCGCAGG AACTGTGTGT GTCCTACACA 4980
ATGGTGCTAT TCTGTGTCAA ACACCTCTGT ATTTTTTAAA ACATCAATTG ATATTAAAAA 5040
TGAAAAGATT ATTGGAAAGT

SEQ ID NO:124 PFJ1Protein sequence:

Protein Accession #: NP_001835.2

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1         11        21        31        41        51
|         |         |         |         |         |
MIRLGAPQSL VLLTLLVAAV LRCQGQDVQE AGSCVQDGQR YNDKDVWKPE PCRICVCDTG   60
TVLCDDIICE DVKDCLSPEI PFGECCPICP TDLATASGQP GPKGQKGEPG DIKDIVGPKG  120
PPGPQGPAGE QGPRGDRGDK GEKGAPGPRG RDGEPGTPGN PGPPGPPGPP GPPGLGGNFA  180
AQMAGGFDEK AGGAQLGVMQ GPMGPMGPRG PPGPAGAPGP QGFQGNPGEP GEPGVSGPMG  240
PRGPPGPPGK PGDDGEAGKP GKAGERGPPG PQGARGFPGT PGLPGVKGHR GYPGLDGAKG  300
EAGAPGVKGE SGSPGENGSP GPMGPRGLPG ERGRTGPAGA AGARGNDGQP GPAGPPGPVG  360
PAGGPGFPGA PGAKGEAGPT GARGPEGAQG PRGEPGTPGS PGPAGASGNP GTDGIPGAKG  420
SAGAPGIAGA PGFPGPRGPP GPQGATGPLG PKGQTGEPGI AGFKGEQGPK GEPGPAGPQG  480
APGPAGEEGK RGARGEPGGV GPIGPPGERG APGNRGFPGQ DGLAGPKGAP GERGPSGLAG  540
PKGANGDPGR PGEPGLPGAR GLTGRPGDAG PQGKVGPSGA PGEDGRPGPP GPQGARGQPG  600
VMGFPGPKGA NGEPGKAGEK GLPGAPGLRG LPGKDGETGA AGPPGPAGPA GERGEQGAPG  660
PSGFQGLPGP PGPPGEGGKP GDQGVPGEAG APGLVGPRGE RGFPGERGSP GAQGLQGPRG  720
LPGTPGTDGP KGASGPAGPP GAQGPPGLQG MPGERGAAGI AGPKGDRGDV GEKGPEGAPG  780
KDGGRGLTGP IGPPGPAGAN GEKGEVGPPG PAGSAGARGA PGERGETGPP GPAGFAGPPG  840
ADGQPGAKGE QGEAGQKGDA GAPGPQGPSG APGPQGPTGV TGPKGARGAQ GPPGATGFPG  900
AAGRVGPPGS NGNPGPPGPP GPSGKDGPKG ARGDSGPPGR AGEPGLQGPA GPPGEKGEPG  960
DDGPSGAEGP PGPQGLAGQR GIVGLPGQRG ERGFPGLPGP SGEPGKQGAP GASGDRGPPG 1020
PVGPPGLTGP AGEPGREGSP GADGPPGRDG AAGVKGDRGE TGAVGAPGAP GPPGSPGPAG 1080
PTGKQGDRGE AGAQGPMGPS GPAGARGIQG PQGPRGDKGE AGEPGERGLK GHRGFTGLQG 1140
LPGPPGPSGD QGASGPAGPS GPRGPPGPVG PSGKDGANGI PGPIGPPGPR GRSGETGPAG 1200
PPGNPGPPGP PGPPGPGIDM SAFAGLGPRE KGPDPLQYMR ADQAAGGLRQ HDAEVDATLK 1260
SLNNQIESIR SPEGSRKNPA RTCRDLKLCH PEWKSGDYWI DPNQGCTLDA MKVFCNMETG 1320
ETCVYPNPAN VPKKNWWSSK SKEKKHIWFG ETINGGFHFS YGDDNLAPNT ANVQMTFLRL 1380
LSTEGSQNIT YHCKNSIAYL DEAAGNLKKA LLIQGSNDVE IRAEGNSRFT YTALKDGCTK 1440
HTGKWGKTVI EYRSQKTSRL PIIDIAPMDI GGPEQEFGVD IGPVCFL
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SEQ ID NO:125 PFH9 DNA SEQUENCE

Nucleic Acid Accession #: NM_005084

Coding sequence: 162-1487(underlined sequences correspond to start and stop codons)

```
1         11        21        31        41        51
|         |         |         |         |         |
GCTGGTCGGA GGCTCGCAGT GCTGTCGGCG AGAAGCAGTC GGGTTTGGAG CGCTTGGGTC   60
GCGTTGGTGC GCGGTGGAAC GCGCCCAGGG ACCCCAGTTC CCGCGAGCAG CTCCGCGCCG  120
CGCCTGAGAG ACTAAGCTGA AACTGCTGCT CAGCTCCCAA GATGGTGCCA CCCAAATTGC  180
ATGTGCTTTT CTGCCTCTGC GGCTGCCTGG CTGTGGTTTA TCCTTTTGAC TGGCAATACA  240
TAAATCCTGT TGCCCATATG AAATCATCAG CATGGGTCAA CAAAATACAA GTACTGATGG  300
CTGCTGCAAG CTTTGGCCAA ACTAAAATCC CCCGGGGAAA TGGGCCTTAT TCCGTTGGTT  360
GTACAGACTT AATGTTTGAT CACACTAATA AGGGCACCTT CTTGCGTTTA TATTATCCAT  420
CCCAAGATAA TGATCGCCTT GACACCCTTT GGATCCCAAA TAAAGAATAT TTTTGGGGTC  480
TTAGCAAATT TCTTGGAACA CACTGGCTTA TGGGCAACAT TTTGAGGTTA CTCTTTGGTT  540
CAATGACAAC TCCTGCAAAC TGGAATTCCC CTCTGAGGCC TGGTGAAAAA TATCCACTTG  600
TTGTTTTTTC TCATGGTCTT GGGGCATTCA GGACACTTTA TTCTGCTATT GGCATTGACC  660
TGGCATCTCA TGGGTTTATA GTTGCTGCTG TAGAACACAG AGATAGATCT GCATCTGCAA  720
CTTACTATTT CAAGGACCAA TCTGCTGCAG AAATAGGGGA CAAGTCTTGG CTCTACCTTA  780
GAACCCTGAA ACAAGAGGAG GAGACACATA TACGAAATGA GCAGGTACGG CAAAGAGCAA  840
AAGAATGTTC CCAAGCTCTC AGTCTGATTC TTGACATTGA TCATGGAAAG CCAGTGAAGA  900
ATGCATTAGA TTTAAAGTTT GATATGGAAC AACTGAAGGA CTCTATTGAT AGGGAAAAAA  960
TAGCAGTAAT TGGACATTCT TTTGGTGGAG CAACGGTTAT TCAGACTCTT AGTGAAGATC 1020
AGAGATTCAG ATGTGGTATT GCCCTGGATG CATGGATGTT TCCACTGGGT GATGAAGTAT 1080
ATTCCAGAAT TCCTCAGCCC CTCTTTTTTA TCAACTCTGA ATATTTCCAA TATCCTGCTA 1140
ATATCATAAA AATGAAAAAA TGCTACTCAC CTGATAAAGA AAGAAAGATG ATTACAATCA 1200
GGGGTTCAGT CCACCAGAAT TTTGCTGACT TCACTTTTGC AACTGGCAAA ATAATTGGAC 1260
ACATGCTCAA ATTAAAGGGA GACATAGATT CAAATGTAGC TATTGATCTT AGCAACAAAG 1320
CTTCATTAGC ATTCTTACAA AAGCATTTAG GACTTCATAA AGATTTTGAT CAGTGGGACT 1380
GCTTGATTGA AGGAGATGAT GAGAATCTTA TTCCAGGGAC CAACATTAAC ACAACCAATC 1440
AACACATCAT GTTACAGAAC TCTTCAGGAA TAGAGAAATA CAATTAGGAT TAAAATAGGT 1500
TTTTT
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SEQ ID NO:126 PFH9 Protein sequence:

Protein Accession #: NP_005075.1

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1         11        21        31        41        51
|         |         |         |         |         |
MVPPKLHVLF CLCGCLAVVY PFDWQYINPV AHMKSSAWVN KIQVLMAAAS FGQTKIPRGN   60
GPYSVGCTDL MFDHTNKGTF LRLYYPSQDN DRLDTLWIPN KEYFWGLSKF LGTHWLMGNI  120
LRLLFGSMTT PANWNSPLRP GEKYPLVVFS HGLGAFRTLY SAIGIDLASH GFIVAAVEHR  180
DRSASATYYF KDQSAAEIGD KSWLYLRTLK QEEETHIRNE QVRQRAKECS QALSLILDID  240
HGKPVKNALD LKFDMEQLKD SIDREKIAVI GHSFGGATVI QTLSEDQRFR CGIALDAWMF  300
PLGDEVYSRI PQPLFFINSE YFQYPANIIK MKKCYSPDKE RKMITIRGSV HQNFADFTFA  360
TGKIIGHMLK LKGDIDSNVA IDLSNKASLA FLQKHLGLHK DFDQWDCLIE GDDENLIPGT  420
NINTTNQHIM LQNSSGIEKY N
```

SEQ ID NO:127 PFH8 DNA SEQUENCE

Nucleic Acid Accession #: NM_015900
Coding sequence: 32-1402 (underlined sequences correspond to start and stop codons)

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1         11        21        31        41        51
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CACGAGCGGC ACGAGGATTT CCAGCTCAGC GATGCCCCCA GGTCCCTGGG AGAGCTGCTT   60
CTGGGTGGGG GGCCTCATTT TGTGGCTCAG CGTTGGAAGT TCAGGGGATG CACCTCCTAC  120
CCCACAGCCA AAGTGCGCTG ACTTCCAGAG CGCCAACCTT TTTGAAGGCA CCGATCTCAA  180
AGTCCAGTTT CTCCTCTTTG TCCCTTCGAA TCCTAGCTGT GGGCAGCTAG TAGAAGGAAG  240
CAGTGACCTC CAAAACTCTG GGTTCAATGC CACTCTGGGA ACCAAACTAA TTATCCATGG  300
ATTCAGGGTT TTAGGAACAA AGCCTTCCTG GATTGACACA TTTATTAGAA CCCTTCTGCG  360
TGCAACGAAT GCTAATGTGA TTGCCGTGGA CTGGATTTAT GGGTCTACAG GAGTCTACTT  420
CTCAGCTGTG AAAAATGTGA TTAAGTTGAG CCTCGAGATC TCCCTTTTCC TCAATAAACT  480
CCTGGTGCTG GGTGTGTCGG AATCCTCAAT CCACATCATT GGTGTTAGCC TGGGGGCCCA  540
CGTTGGGGGC ATGGTGGGAC AGCTCTTCGG AGGCCAGCTG GGACAGATCA CAGGCCTGGA  600
CCCCGCTGGA CCTGAGTACA CCAGGGCCAG TGTGGAAGAG CGCTTGGATG CTGGAGATGC  660
CCTCTTCGTG GAAGCCATCC ACACAGACAC CGACAATTTG GGTATTCGGA TTCCCGTTGG  720
ACATGTGGAC TACTTCGTCA ACGGAGGCCA AGACCAACCT GGCTGCCCCA CCTTCTTTTA  780
CGCAGGTTAT AGTTATCTGA TCTGTGATCA CATGAGGGCT GTGCACCTCT ACATCAGCGC  840
CCTGGAGAAT TCCTGTCCAC TGATGGCCTT TCCCTGTGCC AGCTACAAGG CCTTCCTTGC  900
TGGACGCTGT CTGGATTGCT TTAACCCTTT TCTGCTTTCC TGCCCAAGGA TAGGACTGGT  960
GGAACAAGGT GGTGTCAAGA TAGAGCCGCT CCCCAAGGAA GTGAAAGTCT ACCTCCTGAC 1020
TACTTCCAGT GCTCCGTACT GCATGCATCA CAGCCTCGTG GAGTTTCACT TGAAGGAACT 1080
GAGAAACAAG GACACCAACA TCGAGGTTAC CTTCCTTAGC AGTAACATCA CCTCTTCATC 1140
TAAGATCACC ATACCTAAGC AGCAACGCTA TGGGAAAGGA ATCATAGCCC ATGCCACCCC 1200
ACAATGCCAG ATAAACCAAG TGAAATTCAA GTTTCAGTCT TCCAACCGAG TTTGGAAAAA 1260
AGACCGGACT ACCATTATTG GGAAGTTCTG CACTGCCCTT TTGCCTGTCA ATGACAGAGA 1320
AAAGATGGTC TGCTTACCTG AACCAGTGAA CTTACAAGCA AGTGTGACTG TTTCCTGTGA 1380
CCTGAAGATA GCCTGTGTGT AGTTTAACCT GGGCAGGACA CATCTCCCTG CATTTTTTTT 1440
TTTTTTTTTT GAGAGAGAGG TGTGATGAGG GATGTGTGTG TGCAGCTTAT TGTAGACCAT 1500
TACTACTAAG GAGAAAAGCA AAGCTCTTTC TTATTTTCCT CATAATCAGC TACCCTGGAG 1560
GGGAGGGAGA ACTCATTTTA CAGAACTTGG TTTCCTTTGC CGATCTTATG TACATACCCA 1620
TTTTAGCTTT CCCATGCATA CTTAACTGCA CTTGCTTTAT CTCCTTGGGC ATTCGTACTT 1680
AGGATTCAAT AGAAACATGT ACAGGGTAAA CAATTTTTTA AAAATAAAAC TTCATGGAGT 1740
AAAAAAAAAA AAAAAAA
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SEQ ID NO:128 PFH8 Protein sequence:
Protein Accession #: NP_056984.1

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1         11        21        31        41        51
|         |         |         |         |         |
MPPGPWESCF WVGGLILWLS VGSSGDAPPT PQPKCADFQS ANLFEGTDLK VQFLLFVPSN   60
PSCGQLVEGS SDLQNSGFNA TLGTKLIIHG FRVLGTKPSW IDTFIRTLLR ATNANVIAVD  120
WIYGSTGVYF SAVKNVIKLS LEISLFLNKL LVLGVSESSI HIIGVSLGAH VGGMVGQLFG  180
GQLGQITGLD PAGPEYTRAS VEERLDAGDA LFVEAIHTDT DNLGIRIPVG HVDYFVNGGQ  240
DQPGCPTFFY AGYSYLICDH MRAVHLYISA LENSCPLMAF PCASYKAFLA GRCLDCFNPF  300
LLSCPRIGLV EQGGVKIEPL PKEVKVYLLT TSSAPYCMHH SLVEFHLKEL RNKDTNIEVT  360
FLSSNITSSS KITIPKQQRY GKGIIAHATP QCQINQVKFK FQSSNRVWKK DRTTIIGKFC  420
TALLPVNDRE KMVCLPEPVN LQASVTVSCD LKIACV
```

SEQ ID NO:129 PFH7 DNA SEQUENCE

Nucleic Acid Accession #: NM_014384
Coding sequence: 89-1336 (underlined sequences correspond to start and stop codons)

```
1         11        21        31        41        51
|         |         |         |         |         |
CGTTGCCGGG TCGCAGGTCC CGCCAGTGCG AGCGCAACGG AGGTCGAAGG CGTTCAGACT   60
CTTAGCTGAA CGCGGAGCTG CGGCGGCTAT GCTGTGGAGC GGCTGCCGGC GTTTCGGGGC  120
GCGCCTCGGC TGCCTGCCCG GCGGTCTCCG GGTCCTCGTC CAGACCGGCC ACCGGAGCTT  180
GACCTCCTGC ATCGACCCTT CCATGGGACT TAATGAAGAG CAGAAAGAAT TTCAAAAAGT  240
GGCCTTTGAC TTTGCTGCCC GAGAGATGGC TCCAAATATG GCAGAGTGGG ACCAGAAGGA  300
GCTGTTCCCA GTGGATGTGA TGCGGAAGGC AGCCCAGCTA GGCTTCGGAG GGGTCTACAT  360
ACAAACAGAT GTGGGCGGGT CTGGGCTGTC ACGTCTTGAT ACCTCTGTCA TTTTTGAAGC  420
CTTGGCTACA GGCTGCACCA GCACCACAGC CTATATAAGC ATCCACAACA TGTGTGCCTG  480
GATGATTGAT AGCTTCGGAA ATGAGGAACA GAGGCACAAA TTTTGCCCAC CGCTCTGTAC  540
CATGGAGAAG TTTGCTTCCT ACTGCCTCAC TGAACCAGGA AGTGGGAGTG ATGCTGCCTC  600
TCTTCTGACC TCCGCTAAGA AACAGGGAGA TCATTACATC CTCAATGGCT CCAAGGCCTT  660
CATCAGTGGT GCTGGTGAGT CAGACATCTA TGTGGTCATG TGCCGAACAG GAGGACCAGG  720
CCCCAAGGGC ATCTCATGCA TAGTTGTTGA GAAGGGGACC CCTGGCCTCA GCTTTGGCAA  780
GAAGGAGAAA AAGGTGGGGT GGAACTCCCA GCCAACACGA GCTGTGATCT TCGAAGACTG  840
TGCTGTCCCT GTGGCCAACA GAATTGGGAG CGAGGGGCAG GGCTTCCTCA TTGCCGTGAG  900
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AGGACTGAAC GGAGGGAGGA TCAATATTGC TTCCTGCTCC CTGGGGGCTG CCCACGCCTC 960
TGTCATCCTC ACCCGAGACC ACCTCAATGT CCGGAAGCAG TTTGGAGAGC CTCTGGCCAG 1020
TAACCAGTAC TTGCAATTCA CACTGGCTGA TATGGCAACA AGGCTGGTGG CCGCGCGGCT 1080
GATGGTCCGC AATGCAGCAG TGGCTCTGCA GGAGGAGAGG AAGGATGCAG TGGCCTTGTG 1140
CTCCATGGCC AAGCTCTTTG CTACAGATGA ATGCTTTGCC ATCTGCAACC AGGCCTTGCA 1200
GATGCACGGG GGCTACGGCT ACCTGAAGGA TTACGCTGTT CAGCAGTACG TGCGGGACTC 1260
CAGGGTCCAC CAGATTCTAG AAGGTAGCAA TGAAGTGATG AGGATACTGA TCTCTAGAAG 1320
CCTGCTTCAG GAG<u>TAG</u>AACC CACACTTGTT CTGGCCTGGT GTTCAGTGCG ACTGCAGTCA 1380
GTGTTGAGTG GTGCCATGTG GGCCGCTCTA TTCCAAAGGA ATCATGGATT AGACCCAAGG 1440
GCTGAGCTCC TCTAGGGCAG GACCTGCACC CTGTGTGTTG GCACCAGCAT CGGGTCTTGG 1500
ACTGGGGCAG AATCCCCAGT GGAACCGGAA GAGCTGGACT GATGAGAAAC ATCAGAAGAA 1560
CACATACTAC CTTGTTTTCC TAATGCCAGA AGGGTGACCA GTGAAGATTC ACCGTCAAAC 1620
CATGAAAGTC CTTTCTTGGA TCCACTTTAT CTTGATTAGT CTGCATTTTA CTAGTTCACT 1680
GGATCCCTCC TCTAGGGGCC TGGGGACTTT CACTGATGCT CTTCCTGATT CTAGAGCAAA 1740
GGTGTGGGAA GGGGAAATGG AGGAATGCCC TCCTGTCTGT GTCGTTCTCT GTGCCACAGC 1800
TACAGATGCA GAAGGTTTCT CTGGATAGCA CACCTCTGAA TGTAAATCAT GATAAAATGG 1860
ATATTTGGAA ACTTACTCCT AAGCTGTGAT GTAGGGTGTA TTTCTACTTC TGGACTGCCT 1920
CAATATCAAG GGCTGAGACT TTTGAATGTT GAATATTCGT TGGGTTTCAT GTTAAGACGC 1980
CTGTGGTCCA GGAGTGCTAT TCAGTGTTTC TGTTCCTGAT AAACACTTTG AATATTTTTT 2040
TGTGTTTTTG TTTCCTTTTC TGAAGCTGTT CCTCCTTTTA AATATTTTTA ATCACATTGA 2100
TAAAATCTAT CCTTCATCCA CCTCTGGTTC TACTATAGTT GATTTTTATT TTAAATGTTT 2160
AATTGTATTT GATTAAACAC TTAACTGGAT TTTGGAATAA TAAAACTCTC GTCCAATTTG 2220
GCTTTTAAAA AAAAAAAA

<u>SEQ ID NO:130 PFH7 Protein sequence:</u>
Protein Accession #: NP_055199.1

1 11 21 31 41 51
| | | | | |
MLWSGCRRFG ARLGCLPGGL RVLVQTGHRS LTSCIDPSMG LNEEQKEFQK VAFDFAAREM 60
APNMAEWDQK ELFPVDVMRK AAQLGFGGVY IQTDVGGSGL SRLDTSVIFE ALATGCTSTT 120
AYISIHNMCA WMIDSFGNEE QRHKFCPPLC TMEKFASYCL TEPGSGSDAA SLLTSAKKQG 180
DHYILNGSKA FISGAGESDI YVVMCRTGGP GPKGISCIVV EKGTPGLSFG KKEKKVGWNS 240
QPTRAVIFED CAVPVANRIG SEGQGFLIAV RGLNGGRINI ASCSLGAAHA SVILTRDHLN 300
VRKQFGEPLA SNQYLQFTLA DMATRLVAAR LMVRNAAVAL QEERKDAVAL CSMAKLFATD 360
ECFAICNQAL QMHGGYGYLK DYAVQQYVRD SRVHQILEGS NEVMRILISR SLLQE

SEQ ID NO:131 PFH6 DNA SEQUENCE

Nucleic Acid Accession #: NM_013989
Coding sequence: 707-1105(underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
| | | | | |
GCCTGCAGAG AGAGGCACTT TGCACCACAG ACAGATAGCA AGAAGGGAAA GACAGAGAGT 60
GAGAAAAAAG AGGAGTCAGT CGCTCCTGGG GAAGGGAGAG AGTGAGACTG GGAGAAAGAG 120
AAGCACAGAA AGTGTGTGTA AAACGGAGTA AAGAAAGAAA AAAAAAAAAC TACCCTTAAA 180
GCACATTTAA AAAAAAAAAA CTCTGGCAAT TCAAGAAAGA AACAGGCTAC GTTTAAAGAG 240
CATAGAGACA ATGAAAGGCT AAAGAAAATT TTAAAATCTC TGCCACAGTC TCATAGGTGC 300
TTGGAAATGA AAGTAGAACT GCCTGTCTTT AACGGACTCT GACAGAGGTA ACTGGATTAG 360
GGACGAGTAC GCCAGCTTTT TTTTTTTTTT TTTTTTTTTT TTTAACATCT TAAATCCTGA 420
AAAAAAAAAA AAAAAAAAAA AAAAGGCAGC AGCTCCGAAT TGAATGAATT GATGGGCACA 480
CTCCAACTGC TGGGCTGGAG AGACTGGACT TAGTCTTGCC ATTTCTGCTT CTTTGAAAGA 540
GGAGACAACT TGGGCTTCCT TTTAATTTAG TTTTTTTTCC CCTTCTCCCC CAACCCCCAA 600
CCTTCCCCCT TACCTCCCCC ACCCCCTTTA TCACCACCCC CCTTTTAAAT AAGAGGGTGA 660
AGGGGAACCA GAGCGCACAA GGGAACTGAC TCAGGAGGCA GAGAAG<u>ATG</u>G GCATCCTCAG 720
CGTAGACTTG CTGATCACAC TGCAAATTCT GCCAGTTTTT TTCTCCAACT GCCTCTTCCT 780
GGCTCTCTAT GACTCGGTCA TTCTGCTCAA GCACGTGGTG CTGCTGTTGA GCCGCTCCAA 840
GTCCACTCGC GGAGAGTGGC GGCGCATGCT GACCTCAGAG GGACTGCGCT GCGTCTGGAA 900
GAGCTTCCTC CTCGATGCCT ACAAACAGGT GAAATTGGGT GAGGATGCCC CCAATTCCAG 960
TGTGGTGCAT GTCTCCAGTA CAGAAGGAGG TGACAACAGT GGCAATGGTA CCCAGGAGAA 1020
GATAGCTGAG GGAGCCACAT GCCACCTTCT TGACTTTGCC AGCCCTGAGC GCCCACTAGT 1080
GGTCAACTTT GGCTCAGCCA CT<u>TGA</u>CCTCC TTTCACGAGC CAGCTGCCAG CCTTCCGCAA 1140
ACTGGTGGAA GAGTTCTCCT CAGTGGCTGA CTTCCTGCTG GTCTACATTG ATGAGGCTCA 1200
TCCATCAGAT GGCTGGGCGA TACCGGGGGA CTCCTCTTTG TCTTTTGAGG TGAAGAAGCA 1260
CCAGAACCAG GAAGATCGAT GTGCAGCAGC CCAGCAGCTT CTGGAGCGTT TCTCCTTGCC 1320
GCCCCAGTGC CGAGTTGTGG CTGACCGCAT GGACAATAAC GCCAACATAG CTTACGGGGT 1380
AGCCTTTGAA CGTGTGTGCA TTGTGCAGAG ACAGAAAATT GCTTATCTGG GAGGAAAGGG 1440
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AAAGTTATAT AAAGGCAAGG AAATTAAGAA CTGAATCCAT ATTTCAACAG AGCCCTATTG 1620
GCTTACTGAA AGACAGGAGT TTATCTATCG GAAGAACATG AATCTCTAAC AGCTCCATAC 1680
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TAAAAAGCCC TATGTGAAAA GATCCCAAGA TGGAGAGGAA GAAACGCTAA TTCAGCATGT 1800
GTTCATTCTG CATTGAGAAG GAACTGATAC ATCTGATGCA TGCTTTGAGA CCAGAAGAAA 1860
AGACTTACCT GAATAATTAC TACATTAGGG AAGCTACTGT CTACGTTAAG ATAAAGGGTA 1920

TTGCCTTGGC TCTATTTGGC ATGGATGGAG CCCAGTTGGA AAATTCCCAA ATATTACAAC 1980
AAGTCCTTGA ACCCAGGCCA TGTGGTTAGA CGTTGGTGTT AAGGTTAGAC CTTATGTTAG 2040
AGTCATTTCT GATGTTCCAG CTTCTAGCCA TGTAGTGCTC TCAGTCTTCA TACCCCAGAA 2100
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ATTTGTCATA TGCTCCTAGA GAGGAGAAAG GGGTGATTGA AAGAAAAAAA AATACTTAAA 2460
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TGTATATTTT CAGTGGGTTA ATTATACCCC ATGATACCTA TTAAAGGAAA ACCAGTGGGT 2580
CTGGTGGTGC TGGTCTTTTC CTCCCCATTC CTACAATTTC TATGTGGCCC AAGTCATTCC 2640
TAATCTTGGT CTCTATAGCA GTGTTCTCTC TGAATGCTGA GCTGAAGAAA TTATACGTAC 2700
ATACACACAT ACATACATAC ATACAAATAT ATGTATATAT ATTCTCAGCT GCTGCGGGAG 2760
GTAGGTACCA TGGCCATTCA GCACAGCCTT GATTTCCTCC CAAAGTAGGT GAGCTATAGT 2820
GAAGAATAGG TGCAAACAAA CAAGCTTACT TCCATTGCAA AATAGAAGAA GAGGAAGTTA 2880
GAGATAATTC TGATCAATCA TTTTGGAGGC TTTGTTATAA GGCAACCCCC GGTATATCAT 2940
GGAATTTCCA TTGACATTTG AATTTGGACT TGGATCTTCC CTTGGTCCCA TTAGCTGAGG 3000
TTTAGTAATC TAAAGTCCCT ATAGTATATG ATTATAATGC TATTTTAAAA AATATATATA 3060
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GATTATAGCT CCCAAAAGAA TGGACCAACC ACTTTCGTAT CATAATTTCT TTTTGGTAAA 3180
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GTTGAAAATA CATTCTTAAA CTAGTTGTCT GAAATGAGAA AAGAGTGAGA ACTAGGTGTG 3360
CAAGAACCAA ACGTATTTTA TTTTATTTTT TAAATGGGAG CAACATATCA GTCGTGTCAC 3420
CAGCTGGTAT ATTGTGTAAA TATTAAAGCT CCATTGGGAC TGATTTTTCA TGGCAACATC 3480
AGCTTTCTAA TGTTCTAAAT TCTATAAAAA CCACCCACAA AGAAACAAAG CAAATTTCAT 3540
TATCTAATGA GTTGCTGGAA AATCATATTG AGAATAATTA TTTCAGATTC CTCAGTTGTT 3600
AACTTCTACA TTCAAGGGCT TATCTCTGCC CCCATTGATT TTTAACCTCA AAATGGTGTG 3660
AGATTTACTG TGGAACCCTA AAGCAGTAAA ATAAAAAACC TGGTTGCAGC ACATTCACAC 3720
TGTTGTCCTT AAAATTCCCC TTTTTTCTCT ATGTACGATA AAGTAACAGT ATGTCAGATA 3780
AGCCGGTGGG GGGATGAGAT TAGGCTGAGG CAGTGCTAGT CAACTGGGGG AAAAGGATGA 3840
TGGAAAAATC ACCCAGTTGT GCTATATTTT TAAAGAAGGA GGTCGTTTAT GTGTGCAGAC 3900
AATTCTCCCT GAGGTTAGCC CAATGGAGAA ATGAAGCAGA GGAAGGAAAC ATAGAAAGAC 3960
ATGGGCTATC AGGGAGGAAG ATGTTCAATA GAACATGCAA GAATTTCTGG AAGAAAGGCT 4020
GTGGAAGGGC CAATGGAGAA AATGAATGGA CAAAGCTCAG GAATCCCTAC GCTATGTAGA 4080
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AATTTTTATG ATTTCTTGTG ATGTATTCTT TTATGAAATT AACAAGAACT CATTATTTTG 4200
AGGTAGAGGA AAATCAATGC TTTATCTGAT ATGCTGAGAA ATTATTAGAT TGCCAATACT 4260
CATGTGCGTT TCATGTGTTT TATAAGGTTT GTTCCTTTGA AGAATTGTAG TTCTTAGTCC 4320
CACAGGGAAA TGTGTATCTA TTTATATATC ATAGTATAAA TCTATGATAT ATTTATATCA 4380
TATATAAAAG TCTGAGTTCT CTTTCTTAGT CCCTAATCAT GTTTCTCCCA TAGGCTGTGT 4440
TTACATGGAG CTATCGGTTT AGCCTTTTAA GCTTCATTAG CTTGTCTATT ATTGAAATAG 4500
TTTCCAAGAA ATTTTAGATA TTATCATAAC ATCTGGGTCT ACTCAAACAC TTATTGTTTG 4560
AAAGACTTAT GTCTTGGACC TATCAAAAAC TGACTTTATT TATTGCTTAG TGAAAATACT 4620
AGTGGGATCA ACAATGATTT TCTTGAATGG GCATGAATGG AGATGCCCGC ACAGTAATGT 4680
AGAAATGTTT CATACAGCTA TTAAAATGTA ACTGACCTCC TTAGAGGCAG ATTAGTAACT 4740
GTTCCTACTT TGTATAGCTA AGTGACAGTC ACTTAACTTA CATGACTTTC TTTTTTCACA 4800
TTGGGTCTCT GGTCCTGTGT CTTCACCTCA TTTATAGCAC GTCTCCTTGA TTTTTGGTAG 4860
TATCAACTTC CCAGTGATCT GTTCAGTTAA GTTCTTCTCC CGTTAACCAG GAAGTGCTTA 4920
TTCTCTCATC ACAGTGGGAA GAATAGCCTA TTGTCTTTCA TTTTGCCTGA GTGTATTTTA 4980
CTATTTGGGC TCTGAAATAA AAATTATGAA ATATGGTGAG GTCACATGTT GGTGCTGCCT 5040
TGCTGCATAA AATTCTAGGA GGGCAGGTTA GGAGACAGTT ATGTATGGCC TTTCGGGAAA 5100
ATTCAAAGGG TGGGATTACA AGGGTGTTCC TCAGGCATGC CCCTATGGGC CCTATGTGGA 5160
AGCAAGAAGA ATTGACTGAT TTACAGGACT TCTCTTTATG TCAATCTTAA GAGGATGGAT 5220
GAATCTGGAC ATTTGTTCCA CCCGACCTCT GACTGATGGT TTGGAAAATA ACTTTAATTA 5280
GGATCATATG ACCATTGAAA AAGGAAAAAT GTAGACTCTG ACTTCCGTCC CACTGAAGGA 5340
TTAATGAAAA CCTTTACTAG CATTTAGAGC TTTTCAGAAC ATCCCCACTG TCATGTGTCT 5400
CAGCAGTGGA GACTGCAAGT AAGGCTTTTA ATTTTAGGAG GTTTTTTTTT TTTTTTTTTT 5460
TTCCCCTAAA TGGTATGGCC AAAAGTCAGA GTTAAAATAT ATATAGTTAG ATTCGAACTT 5520
CCTCCTTCAC TCTAAAAATA GAATCCAAAC CCACTCTTCA TATATGCTTC CAGAATGGGG 5580
CTTAAGTACC AATCTCTGCT TTGCAATGGG CACAATCTTG GTCATGTCCT GAGGCTCTCT 5640
AAGAAAAGAG AGGATCTAGG ATGGGAGAGC TAGAAAGTTG CTAACTGGGA AGAACAAGGC 5700
CCTGAGGGGT TGGTCTACCA ATCTGGGAAG ATTTGAAAAC AAACTTCTCG CAACTGAAGG 5760
AAGGCTGAAG GCTGCTGCAA GTCATTGAGT GACTTTAGGA TGAGCAAAAC ATTGGGCCAC 5820
TTCCTAATGC CCTATGTGTA TAGTACCAGA AGCAAGGTCT CAGACTTAAC AGACCCAGCT 5880
CTGTTCCAAG GTGAGTCTGA ACCAATAGAA AGCAAACATG TGCAGATATC CAAACAAGAC 5940
TGCTCATGCA AGTCGGGGCT GGCTACCCGT CTTAGGCAGC AACAGCAGAG CTCCAGGGAG 6000
CTTATTCAAT ATTTACTGAG ACTTCGAAGA CCCAGCAGAT GTTTAATGAA GTCACTATTT 6060
TGGCTCAAAC CCTCCACTTC TCCCCCTCCC CTCAAAAAGC CAACAGGTAA ACACATAAAT 6120
GAAAGAAACC CACAGAAGGG GATGGGAAAT AAAGAAAATT CTCTCAAGAC TTCTCCAGGC 6180
CCATGTCACT GGTCAGCGTG GTTTTTATGT GTATTAGGAT TGGGGGATGT GAAGAAATAA 6240
GTATCCAGTA CTTTATAACC AAAGCAATTA AATGATATTG GGGTAGGGAA TGTTGGCCAG 6300
TTTTGTTTAG TTTTGCCATC ACATTGTCAC CCAGACCTCA CCTAGCCCCA AGTAATCGGG 6360
CGCCCCGAAG AGGGAGACAG AGATGTGCCA GAGTTGACCC AGTGTGCGGA TGATAACTAC 6420
TGACGAAAGA GTCATCGACC TCAGTTAGTG GTTGGATGTA GTCACATTAG TTTGCCTCTC 6480
CCCATCTTTG TCTCCCTGGC AAGGAGAATA TGCGGGACAT GATGCTAAGA GCCCTGGGTA 6540
AATGTGGTGA GAATGCACGC GTGCATATGC TACACATATG TGCTTCTCAG TTGCAGAAAA 6600
TGAACTGCTT TGGGAGATTA TCAGTAGAAA GAGTGTTATC ATATTGGTGC TGAGTGCTAT 6660

GTGTGCTTAT ACAATTTGTT CTTGTATTTT AATAAACTTT GAATAAAAGA ATAAAAAAAA 6720
AAAAAAAAAA AAAAA

<u>SEQ ID NO:132 PFH6 Protein sequence:</u>
Protein Accession #: NP_054644.1

1 11 21 31 41 51
| | | | | |
MGILSVDLLI TLQILPVFFS NCLFLALYDS VILLKHVVLL LSRSKSTRGE WRRMLTSEGL 60
RCVWKSFLLD AYKQVKLGED APNSSVVHVS STEGGDNSGN GTQEKIAEGA TCHLLDFASP 120
ERPLVVNFGS ATXPPFTSQL PAFRKLVEEF SSVADFLLVY IDEAHPSDGW AIPGDSSLSF 180
EVKKHQNQED RCAAAQQLLE RFSLPPQCRV VADRMDNNAN IAYGVAFERV CIVQRQKIAY 240
LGGKGPFSYN LQEVRHWLEK NFSKRXKKTR LAG

SEQ ID NO:133 PFH5 DNA SEQUENCE

Nucleic Acid Accession #: NM_001141
Coding sequence: 72-2102 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
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CAGGCGTGTC CCAGGGGGAG CCCCGCTCTG CAGCCCTGTG CGCCGTAGAG AGCTGGACTT 60
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GCACATGGGA CAAAGTGTCT GTCAGCATCG TGGGGACCCG GGGAGAGAGC CCCCCACTGC 180
CCCTGGACAA TCTCGGCAAG GAGTTCACTG CGGGCGCTGA GGAGGACTTC CAGGTGACGC 240
TCCCGGAGGA CGTAGGCCGA GTGCTGCTGC TGCGCGTGCA CAAGGCGCCC CCAGTGCTGC 300
CCCTGCTGGG GCCCCTGGCC CCGGATGCCT GGTTCTGCCG CTGGTTCCAG CTGACACCGC 360
CGCGGGGCGG CCACCTCCTC TTCCCCTGCT ACCAGTGGCT GGAGGGGGCG GGGACCCTGG 420
TGCTGCAGGA GGGTACAGCC AAGGTGTCCT GGGCAGACCA CCACCCTGTG CTCCAGCAAC 480
AGCGCCAGGA GGAGCTTCAG GCCCGGCAGG AGATGTACCA GTGGAAGGCT TACAACCCAG 540
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CCACAGCCAA GAATGCCAAC TTTTATCTAC AAGCTGGCTC TGCTTTTGCA GAGATGAAAA 660
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TCAACTTCCG GAGGACCCCA GCAGCTGAGC ACGCATTTGA GCACTGGCAG GAGGATGCCT 780
TCTTCGCCTC CCAGTTCCTG AATGGTCTCA ACCCTGTCCT GATCCGCCGC TGTCACTACC 840
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CCGGCCCAAA CAGCCCCATC TTCCTGCCCA CTGATGACAA GTGGGACTGG TTGCTGGCCA 1140
AGACCTGGGT GCGCAATGCC GAGTTCTCCT TCCATGAGGC CCTCACGCAC CTGCTGCACT 1200
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CTGAGGATAT CCGGACCCGA GGAGTTGAAG ACATCCCAGG CTACTACTAC CGTGATGATG 1500
GGATGCAGAT TTGGGGTGCA GTGGAACGCT TTGTCTCTGA AATCATCGGT ATCTACTACC 1560
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GTGCAGGGCA GTTTGACTCC TGTGCTTGGA TGCCCAACCT GCCACCCAGC ATGCAGCTGC 1800
CACCACCCAC CTCCAAAGGC CTGGCAACAT GCGAGGGCTT CATAGCCACC CTCCCACCTG 1860
TCAATGCCAC ATGTGATGTC ATCCTTGCTC TCTGGTTGCT GAGCAAGGAG CCTGGAGACC 1920
AAAGGCCCCT GGGCACCTAT CCGGATGAGC ACTTCACAGA GGAGGCCCCT CGGCGGAGCA 1980
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TTTTGTTTTG CGTTTACAGC CGTGGGGGGA AGCACATAAT CCCGCCCCAG GGCCCACTAG 2460
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CAAAGAGACT GGGCGCAGTG GCTCATGCCC ATAATCCCAG CACTTTGGGA GATGGAGGCG 2580
GGAAAATCAT TTGAGGTCAG AAGTTCAAGG CCAGCCTGGA CGACATAGCG AGACTCCACC 2640
TCTACCAAAA AATAAAAATT AAAAAACAAA AAAAAAAAAA AAAAA

<u>SEQ ID NO:134 PFH5 Protein sequence:</u>
Protein Accession #: NP_001132.1

1 11 21 31 41 51
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MAEFRVRVST GEAFGAGTWD KVSVSIVGTR GESPPLPLDN LGKEFTAGAE EDFQVTLPED 60
VGRVLLLRVH KAPPVLPLLG PLAPDAWFCR WFQLTPPRGG HLLFPCYQWL EGAGTLVLQE 120
GTAKVSWADH HPVLQQQRQE ELQARQEMYQ WKAYNPGWPH CLDEKTVEDL ELNIKYSTAK 180

NANFYLQAGS AFAEMKIKGL LDRKGLWRSL NEMKRIFNFR RTPAAEHAFE HWQEDAFFAS 240
QFLNGLNPVL IRRCHYLPKN FPVTDAMVAS LLGPGTSLQA ELEKGSLFLV DHGILSGIQT 300
NVINGKPQFS AAPMTLLYQS PGCGPLLPLA IQLSQTPGPN SPIFLPTDDK WDWLLAKTWV 360
RNAEFSFHEA LTHLLHSHLL PEVFTLATLR QLPHCHPLFK LLIPHTRYTL HINTLARELL 420
IVPGQVVDRS TGIGIEGFSE LIQRNMKQLN YSLLCLPEDI RTRGVEDIPG YYYRDDGMQI 480
WGAVERFVSE IIGIYYPSDE SVQDDRELQA WVREIFSKGF LNQESSGIPS SLETREALVQ 540
YVTMVIFTCS AKHAAVSAGQ FDSCAWMPNL PPSMQLPPPT SKGLATCEGF IATLPPVNAT 600
CDVILALWLL SKEPGDQRPL GTYPDEHFTE EAPRRSIATF QSRLAQISRG IQERNRGLVL 660
PYTYLDPPLI ENSVSI

SEQ ID NO:135 PFH4 DNA SEQUENCE

Nucleic Acid Accession #: NM_002742
Coding sequence: 236-2974 (underlined sequences correspond to start and stop codons)

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CCTCCCGATC CTCATCCCCT TGCCCTCCCC CAGCCCAGGG ACTTTTCCGG AAAGTTTTTA 120
TTTTCCGTCT GGGCTCTCGG AGAAAGAAGC TCCTGGCTCA GCGGCTGCAA AACTTTCCTG 180
CTGCCGCGCC GCCAGCCCCC GCCCTCCGCT GCCCGGCCCT GCGCCCCGCC GAGCGATGAG 240
CGCCCCTCCG GTCCTGCGGC CGCCCAGTCC GCTGCTGCCC GTGGCGGCGG CAGCTGCCGC 300
AGCGGCCGCC GCACTGGTCC CAGGGTCCGG GCCCGGGCCC GCGCCGTTCT TGGCTCCTGT 360
CGCGGCCCCG GTCGGGGGCA TCTCGTTCCA TCTGCAGATC GGCCTGAGCC GTGAGCCGGT 420
GCTGCTGCTG CAGGACTCGT CCGGGGACTA CAGCCTGGCG CACGTCCGCG AGATGGCTTG 480
CTCCATTGTC GACCAGAAGT TCCCTGAATG TGGTTTCTAC GGAATGTATG ATAAGATCCT 540
GCTTTTTCGC CATGACCCTA CCTCTGAAAA CATCCTTCAG CTGGTGAAAG CGGCCAGTGA 600
TATCCAGGAA GGCGATCTTA TTGAAGTGGT CTTGTCACGT TCCGCCACCT TTGAAGACTT 660
TCAGATTCGT CCCCACGCTC TCTTTGTTCA TTCATACAGA GCTCCAGCTT TCTGTGATCA 720
CTGTGGAGAA ATGCTGTGGG GGCTGGTACG TCAAGGTCTT AAATGTGAAG GGTGTGGTCT 780
GAATTACCAT AAGAGATGTG CATTTAAAAT ACCCAACAAT TGCAGCGGTG TGAGGCGGAG 840
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TTTGATGTCT AAAGTTAAAG TGCCGCACAC ATTTGTCATC CACTCCTACA CCCGGCCCAC 1080
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AGATTGCAGA TTCAACTGCC ATAAACGTTG TGCACCGAAA GTACCAAACA ACTGCCTTGG 1200
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GCAAGATCCA GACCCAGACC ACGAGGACGC CAACAGAACC ATCAGTCCAT CAACAAGCAA 1440
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TGGCGTTGGT GCAGATGTGG CCAGGATGTG GGAGATAGCC ATCCAGCATG CCCTTATGCC 1860
CGTCATTCCC AAGGGCTCCT CCGTGGGTAC AGGAACCAAC TTGCACAGAG ATATCTCTGT 1920
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GATTTTTCCT GATGAAGTAC TGGGTTCTGG ACAGTTTGGA ATTGTTTATG GAGGAAAACA 2040
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ATGTGGGAAA AAAATGAATG AGGAGGGTAG GGAATAAAAT CCTAAGACAC AAATGCATGA 3480
ACAAGTTTTA ATGTATAGTT TTGAATCCTT TGCCTGCCTG GTGTGCCTCA GTATATTTAA 3540
ACTCAAGACA ATGCACCTAG CTGTGCAAGA CCTAGTGCTC TTAAGCCTAA ATGCCTTAGA 3600
AATGTAAACT GCCATATATA ACAGATACAT TTCCCTCTTT CTTATAATAC TCTGTTGTAC 3660
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TATGGAAAAT CAGCTGCTCA GCAACCTTTC ACCTTTGTGT ATTTTTCAAT AATAAAAAAT 3720
ATTCTTGTCA AAAAAAAAAA AA

SEQ ID NO:136 PFH4 Protein sequence:
Protein Accession #: NP_002733.1

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SDIQEGDLIE VVLSRSATFE DFQIRPHALF VHSYRAPAFC DHCGEMLWGL VRQGLKCEGC  180
GLNYHKRCAF KIPNNCSGVR RRRLSNVSLT GVSTIRTSSA ELSTSAPDEP LLQKSPSESF  240
IGREKRSNSQ SYIGRPIHLD KILMSKVKVP HTFVIHSYTR PTVCQYCKKL LKGLFRQGLQ  300
CKDCRFNCHK RCAPKVPNNC LGEVTINGDL LSPGAESDVV MEEGSDDNDS ERNSGLMDDM  360
EEAMVQDAEM AMAECQNDSG EMQDPDPDHE DANRTISPST SNNIPLMRVV QSVKHTKRKS  420
STVMKEGWMV HYTSKDTLRK RHYWRLDSKC ITLFQNDTGS RYYKEIPLSE ILSLEPVKTS  480
ALIPNGANPH CFEITTANVV YYVGENVVNP SSPSPNNSVL TSGVGADVAR MWEIAIQHAL  540
MPVIPKGSSV GTGTNLHRDI SVSISVSNCQ IQENVDISTV YQIFPDEVLG SGQFGIVYGG  600
KHRKTGRDVA IKIIDKLRFP TKQESQLRNE VAILQNLHHP GVVNLECMFE TPERVFVVME  660
KLHGDMLEMI LSSEKGRLPE HITKFLITQI LVALRHLHFK NIVHCDLKPE NVLLASADPF  720
PQVKLCDFGF ARIIGEKSFR RSVVGTPAYL APEVLRNKGY NRSLDMWSVG VIIYVSLSGT  780
FPFNEDEDIH DQIQNAAFMY PPNPWKEISH EAIDLINNLL QVKMRKRYSV DKTLSHPWLQ  840
DYQTWLDLRE LECKIGERYI THESDDLRWE KYAGEQRLQY PTHLINPSAS HSDTPETEET  900
EMKALGERVS IL
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SEQ ID NO:137 PFH3 DNA SEQUENCE

Nucleic Acid Accession #: X95425
Coding sequence: 712-3825 (underlined sequences correspond to start and stop codons)

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TTTGCTTTTG CTCGCTGCTC TCCTGTTTTT CATTCTCCAC ATTTTCTCAA TCCTCTTTCT  240
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SEQ ID NO:138 PFH3 Protein sequence:
Protein Accession #: CAA84700.1

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TCQVCRPGFF KASPHIQSCG KCPPHSYTHE EASTSCVCEK DYFRRESDPP TMACTRPPSA 360
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MDCPAALYQL MLDCWQKERN SRPKFDEIVN MLDKLIRNPS SLKTLVNASC RVSNLLAEHS 960
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SEQ ID NO:139 PFH2 DNA SEQUENCE

Nucleic Acid Accession #: NM_016029
Coding sequence: 78-1097 (underlined sequences correspond to start and stop codons)

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TATGGGCCGA GTGGCAGGGA CGACGCCCAG AATGGGAGCT GACTGATATG GTGGTGTGGG 240
TGACTGGAGC CTCGAGTGGA ATTGGTGAGG AGCTGGCTTA CCAGTTGTCT AAACTAGGAG 300
TTTCTCTTGT GCTGTCAGCC AGAAGAGTGC ATGAGCTGGA AAGGGTGAAA AGAAGATGCC 360
TAGAGAATGG CAATTTAAAA GAAAAAGATA TACTTGTTTT GCCCCTTGAC CTGACCGACA 420
CTGGTTCCCA TGAAGCGGCT ACCAAAGCTG TTCTCCAGGA GTTTGGTAGA ATCGACATTC 480
TGGTCAACAA TGGTGGAATG TCCCAGCGTT CTCTGTGCAT GGATACCAGC TTGGATGTCT 540
ACAGAAAGCT AATAGAGCTT AACTACTTAG GGACGGTGTC CTTGACAAAA TGTGTTCTGC 600
CTCACATGAT CGAGAGGAAG CAAGGAAAGA TTGTTACTGT GAATAGCATC CTGGGTATCA 660
TATCTGTACC TCTTTCCATT GGATACTGTG CTAGCAAGCA TGCTCTCCGG GGTTTTTTTA 720
ATGGCCTTCG AACAGAACTT GCCACATACC CAGGTATAAT AGTTTCTAAC ATTTGCCCAG 780
GACCTGTGCA ATCAAATATT GTGGAGAATT CCCTAGCTGG AGAAGTCACA AAGACTATAG 840
GCAATAATGG AGACCAGTCC CACAAGATGA CAACCAGTCG TTGTGTGCGG CTGATGTTAA 900
TCAGCATGGC CAATGATTTG AAAGAAGTTT GGATCTCAGA ACAACCTTTC TTGTTAGTAA 960
CATATTTGTG GCAATACATG CCAACCTGGG CCTGGTGGAT AACCAACAAG ATGGGGAAGA 1020
AAAGGATTGA GAACTTTAAG AGTGGTGTGG ATGCAGACTC TTCTTATTTT AAAATCTTTA 1080
AGACAAAACA TGACTGAAAA GAGCACCTGT ACTTTTCAAG CCACTGGAGG GAGAAATGGA 1140
AAACATGAAA ACAGCAATCT TCTTATGCTT CTGAATAATC AAAGACTAAT TTGTGATTTT 1200

ACTTTTTAAT AGATATGACT TTGCTTCCAA CATGGAATGA AATAAAAAAT AAATAATAAA 1260
AGATTGCCAT GAATCTTGCA AA

SEQ ID NO:140 PFH2 Protein sequence:
Protein Accession #: NP_057113.1

1 11 21 31 41 51
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MNWELLLWLL VLCALLLLLV QLLRFLRADG DLTLLWAEWQ GRRPEWELTD MVVWVTGASS 60
GIGEELAYQL SKLGVSLVLS ARRVHELERV KRRCLENGNL KEKDILVLPL DLTDTGSHEA 120
ATKAVLQEFG RIDILVNNGG MSQRSLCMDT SLDVYRKLIE LNYLGTVSLT KCVLPHMIER 180
KQGKIVTVNS ILGIISVPLS IGYCASKHAL RGFFNGLRTE LATYPGIIVS NICPGPVQSN 240
IVENSLAGEV TKTIGNNGDQ SHKMTTSRCV RLMLISMAND LKEVWISEQP FLLVTYLWQY 300
MPTWAWWITN KMGKKRIENF KSGVDADSSY FKIFKTKHD

SEQ ID NO:141 PFH1 DNA SEQUENCE
Nucleic Acid Accession #: NM_021614
Coding sequence: 1-1740 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
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ATGAGCAGCT GCAGGTACAA CGGGGGCGTC ATGCGGCCGC TCAGCAACTT GAGCGCGTCC 60
CGCCGGAACC TGCACGAGAT GGACTCAGAG GCGCAGCCCC TGCAGCCCCC CGCGTCTGTC 120
GGAGGAGGTG GCGGCGCGTC CTCCCCGTCT GCAGCCGCTG CCGCCGCCGC CGCTGTTTCG 180
TCCTCAGCCC CCGAGATCGT GGTGTCTAAG CCCGAGCACA ACAACTCCAA CAACCTGGCG 240
CTCTATGGAA CCGGCGGCGG AGGCAGCACT GGAGGAGGCG GCGGCGGTGG CGGGAGCGGG 300
CACGGCAGCA GCAGTGGCAC CAAGTCCAGC AAAAAGAAAA ACCAGAACAT CGGCTACAAG 360
CTGGGCCACC GGCGCGCCCT GTTCGAAAAG CGCAAGCGGC TCAGCGACTA CGCGCTCATC 420
TTCGGCATGT TCGGCATCGT GGTCATGGTC ATCGAGACCG AGCTGTCGTG GGGCGCCTAC 480
GACAAGGCGT CGCTGTATTC CTTAGCTCTG AAATGCCTTA TCAGTCTCTC CACGATCATC 540
CTGCTCGGTC TGATCATCGT GTACCACGCC AGGGAAATAC AGTTGTTCAT GGTGGACAAT 600
GGAGCAGATG ACTGGAGAAT AGCCATGACT TATGAGCGTA TTTTCTTCAT CTGCTTGGAA 660
ATACTGGTGT GTGCTATTCA TCCCATACCT GGGAATTATA CATTCACATG GACGGCCCGG 720
CTTGCCTTCT CCTATGCCCC ATCCACAACC ACCGCTGATG TGGATATTAT TTTATCTATA 780
CCAATGTTCT TAAGACTCTA TCTGATTGCC AGAGTCATGC TTTTACATAG CAAACTTTTC 840
ACTGATGCCT CCTCTAGAAG CATTGGAGCA CTTAATAAGA TAAACTTCAA TACACGTTTT 900
GTTATGAAGA CTTTAATGAC TATATGCCCA GGAACTGTAC TCTTGGTTTT TAGTATCTCA 960
TTATGGATAA TTGCCGCATG GACTGTCCGA GCTTGTGAAA GGTACCATGA TCAACAGGAT 1020
GTTACTAGCA ACTTCCTTGG AGCGATGTGG TTGATATCAA TAACTTTTCT CTCCATTGGT 1080
TATGGTGACA TGGTACCTAA CACATACTGT GGAAAAGGAG TCTGCTTACT TACTGGAATT 1140
ATGGGTGCTG GTTGCACAGC CCTGGTGGTA GCTGTAGTGG CAAGGAAGCT AGAACTTACC 1200
AAAGCAGAAA AACACGTGCA CAATTTCATG ATGGATACTC AGCTGACTAA AAGAGTAAAA 1260
AATGCAGCTG CCAATGTACT CAGGGAAACA TGGCTAATTT ACAAAAATAC AAAGCTAGTG 1320
AAAAAGATAG ATCATGCAAA AGTAAGAAAA CATCAACGAA AATTCCTGCA AGCTATTCAT 1380
CAATTAAGAA GTGTAAAAAT GGAGCAGAGG AAACTGAATG ACCAAGCAAA CACTTTGGTG 1440
GACTTGGCAA AGACCCAGAA CATCATGTAT GATATGATTT CTGACTTAAA CGAAAGGAGT 1500
GAAGACTTCG AGAAGAGGAT TGTTACCCTG GAAACAAAAC TAGAGACTTT GATTGGTAGC 1560
ATCCACGCCC TCCCTGGGCT CATAAGCCAG ACCATCAGGC AGCAGCAGAG AGATTTCATT 1620
GAGGCTCAGA TGGAGAGCTA CGACAAGCAC GTCACTTACA ATGCTGAGCG GTCCCGGTCC 1680
TCGTCCAGGA GGCGGCGGTC CTCTTCCACA GCACCACCAA CTTCATCAGA GAGTAGCTAG

SEQ ID NO:142 PFH1 Protein sequence:
Protein Accession #: NP_067627

1 11 21 31 41 51
| | | | | |
MSSCRYNGGV MRPLSNLSAS RRNLHEMDSE AQPLQPPASV GGGGGASSPS AAAAAAAAVS 60
SSAPEIVVSK PEHNNSNNLA LYGTGGGGST GGGGGGGGSG HGSSSGTKSS KKKNQNIGYK 120
LGHRRALFEK RKRLSDYALI FGMFGIVVMV IETELSWGAY DKASLYSLAL KCLISLSTII 180
LLGLIIVYHA REIQLFMVDN GADDWRIAMT YERIFFICLE ILVCAIHPIP GNYTFTWTAR 240
LAFSYAPSTT TADVDIILSI PMFLRLYLIA RVMLLHSKLF TDASSRSIGA LNKINFNTRF 300
VMKTLMTICP GTVLLVFSIS LWIIAAWTVR ACERYHDQQD VTSNFLGAMW LISITFLSIG 360
YGDMVPNTYC GKGVCLLTGI MGAGCTALVV AVVARKLELT KAEKHVHNFM MDTQLTKRVK 420
NAAANVLRET WLIYKNTKLV KKIDHAKVRK HQRKFLQAIH QLRSVKMEQR KLNDQANTLV 480
DLAKTQNIMY DMISDLNERS EDFEKRIVTL ETKLETLIGS IHALPGLISQ TIRQQQRDFI 540
EAQMESYDKH VTYNAERSRS SSRRRRSSST APPTSSESS

SEQ ID NO:143 PFG9 DNA SEQUENCE
Nucleic Acid Accession #: AL110139, coding region is FGENESH predicted
Coding sequence: 1-1896 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51

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GCTCCCGCCG CCCGCGCCAG CAGAGCCGAG TCCGTCTCCG CGCCGTGGCC CGAACCCGAG  120
CGCGAGTCGC GGCCACCGCC CGGCCCGGGG CCCGGGAACA CCACCCGGTT TGGGTCTGGG  180
GCGGCGGGCG GCAGCGGCAG CTCCAGCTCC AACAGCAGTG GCGACGCCTT GGTGACCCGC  240
ATTTCCATCC TCCTCCGCGA CCTACCCACC CTCAAGGCAG CCGTGATCGT GGCGTTCGCC  300
TTTACCACCC TCCTCATCGC CTGCCTGCTG CTGCGCGTCT TCAGGTCGGG AAAGAGGTTA  360
AAGAAGACAC GCAAGTATGA TATCATCACC ACTCCAGCAG AGCGAGTGGA AATGGCGCCA  420
CTAAATGAAG AGGATGATGA AGATGAGGAC TCCACAGTAT TCGACATCAA ATACAGAGTG  480
TCCTTGCCGG CTGCACTGAG ACGTCAGCTG CCAGGGTGCC AGACGCTACT GACAGTTCCT  540
GTGCCCCCAC CCTTCATCCT CGACATTGAC CTTCCAGCAA GATGCAGTGG AAGGCCTGAT  600
GGTGGAATCA GACCTGGTAA AACCTGTTTC CCAGCCTGGT GGCATCCTGT GGAAAGTTGG  660
TCAGCTGCAA CCTGGGGTGT GAAGGACTGG ACCTGGAAGC CCTCTTGCGT CGGAGGTGTT  720
GAAACCAAAA CGAACGTTAT GTATAAAACC CCAGCTCCAT CGTGCGTGTC AGGCATCTGC  780
TCAGACTGTC ACTGGCAAGC TCGTTTCCAC GTCACCACAA TGGAGTTGCT TCTGCCACCC  840
TTTGGGCATC CCTTTAAAGT GCCCCCTACT TCTACTCCCC ATGGTTTTCG ACAACTGCAG  900
CTGAATCTCA TGGAAAAGCT GGATTCCTCT GCCTTACGCA GAAACACCCG GGCTCCATCT  960
GCCAGGTGCT TGCCACTGGT CCTGGCAGAA ATGGCGGCTG CTGAAAGTGA CCTTCCAAAT  1020
CCTTGGTGGC ACTTCAGCGC CACAGGCTCT CCAATAAAAA CCCTTTACAC ACAAACCATG  1080
AGTACCTTGG GCTTGGATGT TTTCTGTGGT GCCGGCCAGC GGGGCACCTT TTGTGAAGAC  1140
AGAGCAGTGA CTAAGGTTCT CCAGGGTAGC TCTTTCTCCA AACAGCTGCG CTGGAAGCCA  1200
GCCCTAGAGA GTGGGTTTCC CCATCATCTC AGGCTTCTCA GAGAGTGTCC TCCGCTGAGC  1260
ACCCATCCTG TCAGGTTGGC TCGTTCAGAT GCCCGGGGAC AAGCCAGCCT GACGGGGAGG  1320
AGGGTGTTTC GGCGTCCGCG GCAGTCTCTG CATGGCGGAG GGTCAGCGGG TACCGCAACT  1380
TGCCTTTTGG TTTTGAAGAT TCTGTTGAGG CGCCATCCTC ACCTTGACCT CTTCTACAAA  1440
ATCTGTCTCC CCTGCTGTGC CGTGGAACAC CTACGGGAAG CCAAGAGAAG CTCAGTGACT  1500
GTCCTTGCGT CATTTGAGCA GAGCCCACAA AAGGCAGCTG CTGCCCACGG GGAGCCTGTC  1560
AAACGAGGGC CCAGTGGGCA ATTGACCAGA CACACATGCC CTGGCTGGGG GATCACACAT  1620
GCGAACCTGC AGACAATTCC AGATACCCAA GGCCAGGAAG GCCCACGTGA GGATGTCACT  1680
CACCCTGGAG GAGACTTGGA TGGGGTGGCA AATTTCTATT TGGAGGAAGA GGGTTTCCAG  1740
GATGGCAGAT GCCAGAAGAT GGTCCTGATG TCTGAGGAAG GGCCACCTAG TTTGACAGGA  1800
TGTGAGAGGC TCACAGGTTC CCATCACTTC TCCAGCCATT CCAAGTCTTG GTCCTTCCTT  1860
TCCCCCCGAC AGCCCCTGTT TCTGTCCAGG CCCTGA
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SEQ ID NO:144 PFG9 Protein sequence:

Protein Accession #: none available, FGENESH predicted

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1         11        21        31        41        51
|         |         |         |         |         |
MRAVPLPAPL LPLLLLALLA APAARASRAE SVSAPWPEPE RESRPPPGPG PGNTTRFGSG  60
AAGGSGSSSS NSSGDALVTR ISILLRDLPT LKAAVIVAFA FTTLLIACLL LRVFRSGKRL  120
KKTRKYDIIT TPAERVEMAP LNEEDDEDED STVFDIKYRV SLPAALRRQL PGCQTLLTVP  180
VPPPFILDID LPARCSGRPD GGIRPGKTCF PAWWHPVESW SAATWGVKDW TWKPSCVGGV  240
ETKTNVMYKT PAPSCVSGIC SDCHWQARFH VTTMELLLPP FGHPFKVPPT STPHGFRQLQ  300
LNLMEKLDSS ALRRNTRAPS ARCLPLVLAE MAAAESDLPN PWWHFSATGS PIKTLYTQTM  360
STLGLDVFCG AGQRGTFCED RAVTKVLQGS SFSKQLRWKP ALESGFPHHL RLLRECPPLS  420
THPVRLARSD ARGQASLTGR RVFRRPRQSL HGGGSAGTAT CLLVLKILLR RHPHLDLFYK  480
ICLPCCAVEH LREAKRSSVT VLASFEQSPQ KAAAAHGEPV KRGPSGQLTR HTCPGWGITH  540
ANLQTIPDTQ GQEGPREDVT HPGGDLDGVA NFYLEEEGFQ DGRCQKMVLM SEEGPPSLTG  600
CERLTGSHHF SSHSKSWSFL SPRQPLFLSR P
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SEQ ID NO:145 PFG6 DNA SEQUENCE

Nucleic Acid Accession #: NM_013427

Coding sequence: 875-3799 (underlined sequences correspond to start and stop codons)

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GTCTCCTGAA GCTCCCTCCT CCACGGAGAG CGCTGAGCGC CGCCGGGAAT TCCATCCCAC  120
CGTGGGCACG CAGTCTTTGG AGGTCCCGGG CGCAGCACGC TCGGTGTCCC CACACTGCAG  180
CAAGACAGAG ACCCCGCGGG AACCTTGAGC TTGGAACAAC CCTTGAGCCT CTGCAGTCGG  240
AAGAGTGGGC GCAGCAGCCC AGCGGAGGCC AGGCGCGCAA CCTCGGGCGC CGGGGCAAGG  300
AGAGAGTGCA GGGAGGCGCA GCTCAGGCGC CCGGCTCAGG AGCGGGAGGA AGTTCTCGCG  360
GCGCCGGGAG CGCGGTGGAC GCGCCCTGGG CGCACGCCCA GGCAGCCTTC TCCCTGGCCC  420
TCGGGACTGT CCTCGGGCGG CAAGGAGGAG CTTGCTGGAG TCTTAGAGGC CATCCAGAGC  480
CAGCGAGCAG GAGCGCTGCG TCTCCCGCCT CAGCTAGGAA GGGGGAGTGG CGCTGGCAGG  540
CTGGAGCTGG GAACCCAGCG AGCGCCTGAC CTTCCTCCTC CTCTTCCTGA CCCTCTTCGC  600
GTCTTGGGCT CCGGAGGAAG GTTCTAGCGG CTGCAGGAGG TCCCCAGACC CATTTTCCTA  660
GAAGGCTGGT GATGGATCTG CTGCTCCTGC CGCCGCCGGG GCACTTGGAG CGCACCGGCG  720
GCGCGTGAGC TGGGCTTTGC TCTCCACCGC CCTGGGCAAA CCCCGGGCCA GCCCCGCCTG  780
GCACCTTTGC CTGAGTCCCT TTCGGTTCCC GACCCAAAGC CACCAGCGTC CAGGGAGGGA  840
GGAGGAGGTG GTCCTCAGGT GCAGCCCCGC CGAGATGTCC GCGCAGAGCC TGCTCCACAG  900
CGTCTTCTCC TGTTCCTCGC CCGCTTCAAG TAGCGCGGCC TCGGCCAAGG GCTTCTCCAA  960
GAGGAAGCTG CGCCAGACCC GCAGCCTGGA CCCGGCCCTG ATCGGCGGCT GCGGGAGCGA  1020
CGAGGCGGGC GCGGAGGGCA GTGCGCGGGG AGCCACGGCG GGCCGCCTCT ACTCCCCATC  1080
ACTCCCAGCC GAGAGTCTCG GCCCTCGCTT GGCGTCCTCT TCCCGGGGTC CGCCCCCCAG  1140
GGCCACCAGG CTACCGCCTC CTGGACCTCT TTGCTCGTCC TTCTCCACAC CCAGCACCCC  1200
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GCAGGAGAAG TCACCATCCG GCAGCTTTCA CTTTGACTAT GAGGTTCCCC TGGGTCGCGG 1260
CGGCCTCAAG AAGAGCATGG CCTGGGACCT GCCTTCTGTC CTGGCCGGGC CAGCCAGTAG 1320
CCGAAGCGCT TCCAGCATCC TCTGTTCATC CGGGGGAGGC CCCAATGGCA TCTTCGCTTC 1380
TCCTAGGAGG TGGCTCCAGC AGAGGAAGTT CCAGTCCCCA CCCGACAGTC GCGGGCACCC 1440
CTACGTCGTG TGGAAATCCG AGGGTGATTT CACCTGGAAC AGCATGTCAG GCCGCAGTGT 1500
GCGGCTGAGG TCAGTCCCCA TCCAGAGTCT CTCAGAGCTG GAGAGGGCCC GGCTGCAGGA 1560
AGTGCCTTTT TATCAGTTGC AACAGGACTG TGACCTGAGC TGTCAGATCA CCATTCCCAA 1620
AGATGGACAA AAGAGAAAGA AATCTTTAAG AAAGAAACTG GATTCACTAG GAAAGGAGAA 1680
AAACAAAGAC AAAGAATTCA TCCCACAGGC ATTTGGAATG CCCTTATCCC AAGTCATTGC 1740
GAATGACAGG GCCTATAAAC TCAAGCAGGA CTTGCAGAGG GACGAGCAGA AAGATGCATC 1800
TGACTTTGTG GCTTCCCTCC TCCCATTTGG AAATAAAAGA CAAAACAAAG AACTCTCAAG 1860
CAGTAACTCA TCTCTCAGCT CAACCTCAGA AACACCGAAT GAGTCAACGT CCCCAAACAC 1920
CCCGGAACCG GCTCCTCGGG CTAGGAGGAG GGGTGCCATG TCAGTGGATT CTATCACCGA 1980
TCTTGATGAC AATCAGTCTC GACTACTAGA AGCTTTACAA CTTTCCTTGC CTGCTGAGGC 2040
TCAAAGTAAA AAGGAAAAAG CCAGAGATAA GAAACTCAGT CTGAATCCTA TTTACAGACA 2100
GGTCCCTAGG CTGGTGGACA GCTGCTGTCA GCACCTAGAA AAACATGGCC TCCAGACAGT 2160
GGGGATATTC CGAGTTGGAA GCTCAAAAAA GAGAGTGAGA CAATTACGTG AGGAATTTGA 2220
CCGTGGGATT GATGTCTCTC TGGAGGAGGA GCACAGTGTT CATGATGTGG CAGCCTTGCT 2280
GAAAGAGTTC CTGAGGGACA TGCCAGACCC CCTTCTCACC AGGGAGCTGT ACACAGCTTT 2340
CATCAACACT CTCTTGTTGG AGCCGGAGGA ACAGCTGGGC ACCTTGCAGC TCCTCATATA 2400
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GACATCTCTA AACTTAGCCA CCATATTTGG ACCCAACCTG CTGCACAAGC AGAAGTCATC 2580
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GCCCGAGACG CTGGTC<u>TGA</u>G CCCGCACCCA GCCGAGCCCC CCCTGCCCCG AGCCCCCCGC 3840
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CATATTTTTA CATAGGAGTC AGATACAAAA AGAAAAATCA CTGAATGCTT TTAGATATTG 4440
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ATAATGTATA ATTTTTATGT ATTTTTCAAA ACTACAAACT GGAATCCAAC TATAAAGTGT 4680
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TTGACCAGCA GAAGGCGATA CGCTTCAGTA TTTTATGCAA TTTTTTTTCA CTTCGAAGGG 4980
AAAGTGTATT ATAAAAAAAG ATTTTTTTTT TTTAAAACAT GCTACTCTTA ATTTTCATGT 5040
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AGTTAAGCAA AAAAAAAAAA AAAAAAAAAA AAA

<u>SEQ ID NO:146 PFG6 Protein sequence:</u>
Protein Accession #: NP_038286.1

1 11 21 31 41 51
| | | | | |
MSAQSLLHSV FSCSSPASSS AASAKGFSKR KLRQTRSLDP ALIGGCGSDE AGAEGSARGA 60
TAGRLYSPSL PAESLGPRLA SSSRGPPPRA TRLPPPGPLC SSFSTPSTPQ EKSPSGSFHF 120
DYEVPLGRGG LKKSMAWDLP SVLAGPASSR SASSILCSSG GGPNGIFASP RRWLQQRKFQ 180
SPPDSRGHPY VVWKSEGDFT WNSMSGRSVR LRSVPIQSLS ELERARLQEV PFYQLQQDCD 240
LSCQITIPKD GQKRKKSLRK KLDSLGKEKN KDKEFIPQAF GMPLSQVIAN DRAYKLKQDL 300
QRDEQKDASD FVASLLPFGN KRQNKELSSS NSSLSSTSET PNESTSPNTP EPAPRARRRG 360

AMSVDSITDL DDNQSRLLEA LQLSLPAEAQ SKKEKARDKK LSLNPIYRQV PRLVDSCCQH 420
LEKHGLQTVG IFRVGSSKKR VRQLREEFDR GIDVSLEEEH SVHDVAALLK EFLRDMPDPL 480
LTRELYTAFI NTLLLEPEEQ LGTLQLLIYL LPPCNCDTLH RLLQFLSIVA RHADDNISKD 540
GQEVTGNKMT SLNLATIFGP NLLHKQKSSD KEFSVQSSAR AEESTAIIAV VQKMIENYEA 600
LFMVPPDLQN EVLISLLETD PDVVDYLLRR KASQSSSPDM LQSEVSFSVG GRHSSTDSNK 660
ASSGDISPYD NNSPVLSERS LLAMQEDAAP GGSEKLYRVP GQFMLVGHLS SSKSRESSPG 720
PRLGKDLSEE PFDIWGTWHS TLKSGSKDPG MTGSSGDIFE SSSLRAGPCS LSQGNLSPNW 780
PRWQGSPAEL DSDTQGARRT QAAAPATEGR AHPAVSRACS TPHVQVAGKA ERPTARSEQY 840
LTLSGAHDLS ESELDVAGLQ SRATPQCQRP HGSGRDDKRP PPPYPGPGKP AAAAAWIQGP 900
PEGVETPTDQ GGQAAEREQQ VTQKKLSSAN SLPAGEQDSP RLGDAGWLDW QRERWQIWEL 960
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SEQ ID NO:147 PFG4 DNA SEQUENCE

Nucleic Acid Accession #: NM_002202
Coding sequence: 240-1289 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
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ATTGGCAACC CCAGGGGCCA ATATTTCCCA CTTAGCCACA GCTCCAGCAT CCTCTCTGTG 180
GGCTGTTCAC CAACTGTACA ACCACCATTT CACTGTGGAC ATTACTCCCT CTTACAGAT<u>A</u> 240
<u>TG</u>GGAGACAT GGAGATCCA CCAAAAAAAA AACGTCTGAT TTCCCTATGT GTTGGTTGCG 300
GCAATCAGAT TCACGATCAG TATATTCTGA GGGTTTCTCC GGATTTGGAA TGGCATGCGG 360
CATGTTTGAA ATGTGCGGAG TGTAATCAGT ATTTGGACGA GAGCTGTACA TGCTTTGTTA 420
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AGTGCAGCAT CGGCTTCAGC AAGAACGACT TCGTGATGCG TGCCCGCTCC AAGGTGTATC 540
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TAGGCGCTGG CGACCCGCTC AGTCCCCTGC ATCCAGCGCG GCCACTGCAA ATGGCAGCGG 720
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CAGGAACTCC CATGGTGGCT GCCAGTCCAG AGAGACACGA CGGTGGCTTA CAGGCTAACC 1080
CAGTGGAAGT ACAAAGTTAC CAGCCACCTT GGAAAGTACT GAGCGACTTC GCCTTGCAGA 1140
GTGACATAGA TCAGCCTGCT TTTCAGCAAC TGGTCAATTT TTCAGAAGGA GGACCGGGCT 1200
CTAATTCCAC TGGCAGTGAA GTAGCATCAA TGTCCTCTCA ACTTCCAGAT ACACCTAACA 1260
GCATGGTAGC CAGTCCTATT GAGGCA<u>TGA</u>G GAACATTCAT TCTGTATTTT TTTTCCCTGT 1320
TGGAGAAAGT GGGAAATTAT AATGTCGAAC TCTGAAACAA AAGTATTTAA CGACCCAGTC 1380
AATGAAAACT GAATCAAGAA ATGAATGCTC CATGAAATGC ACGAAGTCTG TTTTAATGAC 1440
AAGGTGATAT GGTAGCAACA CTGTGAAGAC AATCATGGGA TTTTACTAGA ATTAAACAAC 1500
AAACAAAACG CAAAACCCAG TATATGCTAT TCAATGATCT TAGAAGTACT GAAAAAAAAA 1560
GACGTTTTTA AAACGTAGAG GATTTATATT CAAGGATCTC AAAGAAAGCA TTTTCATTTC 1620
ACTGCACATC TAGAGAAAAA CAAAAATAGA AAATTTTCTA GTCCATCCTA ATCTGAATGG 1680
TGCTGTTTCT ATATTGGTCA TTGCCTTGCC AAACAGGAGC TCCAGCAAAA GCGCAGGAAG 1740
AGAGACTGGC CTCCTTGGCT GAAAGAGTCC TTTCAGGAAG GTGGAGCTGC ATTGGTTTGA 1800
TATGTTTAAA GTTGACTTTA ACAAGGGGTT AATTGAAATC CTGGGTCTCT TGGCCTGTCC 1860
TGTAGCTGGT TTATTTTTTA CTTTGCCCCC TCCCCACTTT TTTTGAGATC CATCCTTTAT 1920
CAAGAAGTCT GAAGCGACTA TAAAGGTTTT TGAATTCAGA TTTAAAAACC AACTTATAAA 1980
GCATTGCAAC AAGGTTACCT CTATTTTGCC ACAAGCGTCT CGGGATTGTG TTTGACTTGT 2040
GTCTGTCCAA GAACTTTTCC CCCAAAGATG TGTATAGTTA TTGGTTAAAA TGACTGTTTT 2100
CTCTCTCTAT GGAAATAAAA AGGAAAAAAA AAAGGAAACT TTTTTTGTTT GCTCTTGCAT 2160
TGCAAAAATT ATAAAGTAAT TTATTATTTA TTGTCGGAAG ACTTGCCACT TTTCATGTCA 2220
TTTGACATTT TTTGTTTGCT GAAGTGAAAA AAAAAGATAA AGGTTGTACG GTGGTCTTTG 2280
AATTATATGT CTAATTCTAT GTGTTTTGTC TTTTTCTTAA ATATTATGTG AAATCAAAGC 2340
GCCATATGTA GAATTATATC TTCAGGACTA TTTCACTAAT AAACATTTGG CATAGAT

<u>SEQ ID NO:148 PFG4 Protein sequence:</u>
Protein Accession #: NP_002193.1

1 11 21 31 41 51
| | | | | |
MGDPPKKKRL ISLCVGCGNQ IHDQYILRVS PDLEWHAACL KCAECNQYLD ESCTCFVRDG 60
KTYCKRDYIR LYGIKCAKCS IGFSKNDFVM RARSKVYHIE CFRCVACSRQ LIPGDEFALR 120
EDGLFCRADH DVVERASLGA GDPLSPLHPA RPLQMAAEPI SARQPALRPH VHKQPEKTTR 180
VRTVLNEKQL HTLRTCYAAN PRPDALMKEQ LVEMTGLSPR VIRVWFQNKR CKDKKRSIMM 240
KQLQQQQPND KTNIQGMTGT PMVAASPERH DGGLQANPVE VQSYQPPWKV LSDFALQSDI 300
DQPAFQQLVN FSEGGPGSNS TGSEVASMSS QLPDTPNSMV ASPIEA

SEQ ID NO:149 PFG2 DNA SEQUENCE

Nucleic Acid Accession #: NM_001172
Coding sequence: 39-1103 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51

GCGGAGCTCT GCCTTGGAGA TTCTCAGTGC TGCGGATCAT GTCCCTAAGG GGCAGCCTCT 60
CGCGTCTCCT CCAGACGCGA GTGCATTCCA TCCTGAAGAA ATCCGTCCAC TCCGTGGCTG 120
TGATAGGAGC CCCGTTCTCA CAAGGGCAGA AAAGAAAAGG AGTGGAGCAT GGTCCCGCTG 180
CCATAAGAGA AGCTGGCTTG ATGAAAAGGC TCTCCAGTTT GGGCTGCCAC CTAAAAGACT 240
TTGGAGATTT GAGTTTTACT CCAGTCCCCA AAGATGATCT CTACAACAAC CTGATAGTGA 300
ATCCACGCTC AGTGGGTCTT GCCAACCAGG AACTGGCTGA GGTGGTTAGC AGAGCTGTGT 360
CAGATGGCTA CAGCTGTGTC ACACTGGGAG GAGACCACAG CCTGGCAATC GGTACCATTA 420
GTGGCCATGC CCGACACTGC CCAGACCTTT GTGTTGTCTG GGTTGATGCC CATGCTGACA 480
TCAACACACC CCTTACCACT TCATCAGGAA ATCTCCATGG ACAGCCAGTT TCATTTCTCC 540
TCAGAGAACT ACAGGATAAG GTACCACAAC TCCCAGGATT TTCCTGGATC AAACCTTGTA 600
TCTCTTCTGC AAGTATTGTG TATATTGGTC TGAGAGACGT GGACCCTCCT GAACATTTTA 660
TTTTAAAGAA CTATGATATC CAGTATTTTT CCATGAGAGA TATTGATCGA CTTGGTATCC 720
AGAAGGTCAT GGAACGAACA TTTGATCTGC TGATTGGCAA GAGACAAAGA CCAATCCATT 780
TGAGTTTTGA TATTGATGCA TTTGACCCTA CACTGGCTCC AGCCACAGGA ACTCCTGTTG 840
TCGGGGGACT AACCTATCGA GAAGGCATGT ATATTGCTGA GGAAATACAC AATACAGGGT 900
TGCTATCAGC ACTGGATCTT GTTGAAGTCA ATCCTCAGTT GGCCACCTCA GAGGAAGAGG 960
CGAAGACTAC AGCTAACCTG GCAGTAGATG TGATTGCTTC AAGCTTTGGT CAGACAAGAG 1020
AAGGAGGGCA TATTGTCTAT GACCAACTTC CTACTCCCAG TTCACCAGAT GAATCAGAAA 1080
ATCAAGCACG TGTGAGAATT TAGGAGACAC TGTGCACTGA CATGTTTCAC AACAGGCATT 1140
CCAGAATTAT GAGGCATTGA GGGGATAGAT GAATACTAAA TGGTTGTCTG GGTCAATACT 1200
GCCTTAATGA GAACATTTAC ACATTCTCAC AATTGTAAAG TTTCCCCTCT ATTTTGGTGA 1260
CCAATACTAC TGTAAATGTA TTTGGTTTTT TGCAGTTCAC AGGGTATTAA TATGCTACAG 1320
TACTATGTAA ATTTAAAGAA GTCATAAACA GCATTTATTA CCTTGGTATA TCATACTGGT 1380
CTTGTTGCTG TTGTTCCTTC ACATTTAAGT GGTTTTTCAT CTTTCCTCCC TCCTCCCACA 1440
GCCTGGCTAT ACAGTGCATC CTTGAACTGT CAGCCCACAG CAGCAATATG CTTATTCTAT 1500
CCACATCCCT AACATCATGC ATTCACAAGG TCAAAGTTCT GGTCCACAAA CCCTTCCCTA 1560
TAGAAGTTCA ATGGCTGCGA AAGAATTTGT AGTAAACCAG GCCTCCCAGG ATGGCGAGCT 1620
CCAGTAAGAT GATAATGGAA AGCAGCAGCT TGTTGGTTGT CACTCTACAA AGAGAAGCAA 1680
AGTGGGGAGT AGTCAGAAGT TTGGATAACC TTCCTTCTAA ACATTTGGGG GTTAGACCTG 1740
GGACCACGGC TGGATACTCT GAGGCTGTAT GTTTGATCAC ACAGCCACTT AGCAGGAAGT 1800
ACTCATAAGG TTCTTTAGCT GTCACTTAGG GATAACACTG TCTACCTCAC AGAAATGTTA 1860
AACTGAGACA ATAAAACCCA AAGCAT

SEQ ID NO:150 PFG2 Protein sequence:
Protein Accession #: NP_001163.1

1 11 21 31 41 51

MSLRGSLSRL LQTRVHSILK KSVHSVAVIG APFSQGQKRK GVEHGPAAIR EAGLMKRLSS 60
LGCHLKDFGD LSFTPVPKDD LYNNLIVNPR SVGLANQELA EVVSRAVSDG YSCVTLGGDH 120
SLAIGTISGH ARHCPDLCVV WVDAHADINT PLTTSSGNLH GQPVSFLLRE LQDKVPQLPG 180
FSWIKPCISS ASIVYIGLRD VDPPEHFILK NYDIQYFSMR DIDRLGIQKV MERTFDLLIG 240
KRQRPIHLSF DIDAFDPTLA PATGTPVVGG LTYREGMYIA EEIHNTGLLS ALDLVEVNPQ 300
LATSEEEAKT TANLAVDVIA SSFGQTREGG HIVYDQLPTP SSPDESENQA RVRI

SEQ ID NO:151 PFG1 DNA SEQUENCE

Nucleic Acid Accession #: NM_017806
Coding sequence: 80-1255 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51

AATTATATAT TTTTACTCTA TGTTTCTCTA CATGTTTTTT TCTTTCCGTT GCTGGCGGAA 60
GAGGCACGTG CGCTGCTGAA TGGAGCTGGT CGCTGGTTGC TACGAGCAGG TCCTCTTTGG 120
GTTCGCTGTA CACCCGGAGC CCAAGGCTTG CGGCGACCAC GAGCAATGGA CTCTTGTGGC 180
TGACTTCACT CACCATGCTC ACACTGCCTC CTTGTCAGCA GTAGCTGTAA ATAGTCGTTT 240
TGTGGTCACT GGGAGCAAAG ATGAAACAAT TCACATTTAT GACATGAAAA AGAAGATTGA 300
GCATGGGGCT CTAGTGCATC ACAGTGGTAC AATAACTTGC CTGAAATTCT ATGGCAACAG 360
GCATTTAATC AGTGGAGCGG AAGATGGACT CATCTGTATC TGGGATGCAA AGAAATGGGA 420
ATGCCTGAAG TCAATTAAAG CTCACAAAGG ACAGGTGACC TTCCTTTCTA TTCACCCATC 480
TGGCAAGTTG GCCCTGTCGG TTGGTACAGA TAAAACTTTA AGAACGTGGA ATCTTGTAGA 540
AGGAAGATCA GCATTCATAA AAAATATAAA ACAAAATGCT CACATAGTAG AATGGTCCCC 600
AAGAGGAGAG CAGTATGTAG TTATCATACA GAATAAAATA GACATCTATC AGCTTGACAC 660
TGCATCCATT AGTGGCACCA TCACAAATGA AAAGAGAATT TCCTCTGTTA AATTTCTTTC 720
AGAGTCTGTC CTTGCAGTGG CTGGAGATGA AGAAGTTATA AGGTTTTTTG ACTGTGATTC 780
ACTAGTGTGC CTCTGCGAAT TTAAAGCTCA TGAAAACAGG GTAAAGGACA TGTTCAGTTT 840
TGAAATTCCA GAGCATCATG TTATTGTTTC AGCATCGAGT GATGGTTTCA TCAAAATGTG 900
GAAGCTTAAG CAGGATAAGA AAGTTCCCCC ATCTTTACTC TGTGAAATAA ACACTAATGC 960
CAGGCTGACG TGTCTTGGAG TGTGGCTAGA CAAAGTGGCA GACATGAAAA GCCTTCCTCC 1020
AGCTGCAGAG CCTTCTCCTG TAAGTAAAGA ACAGTCCAAA ATTGGCAAAA AGGAGCCTGG 1080
TGACACAGTG CACAAAGAAG AAAAGCGGTC AAAACCTAAC ACAAAGAAAC GCGGTTTAAC 1140

AGGTGACAGT AAGAAAGCAA CAAAAGAAAG TGGCCTGATA TCAACCAAGA AGAGGAAAAT 1200
GGTAGAAATG TTGGAAAAGA AGAGGAAAAA GAAGAAAATA AAAACAATGC AGTGAATCAC 1260
AGATGTCTCC TGAAAGAACT CTTTTAGATG AAATCATTCT ACTCAAATGT ACCTTAATTT 1320
TTTTTTTTCC CTGAGTAAAA GCAAGAAATT TCTTCCTTTG GAAAAAATAT ATATATTAAA 1380
AAACCACTTT TAGATGGTTT TTTTTAAAAA AAAAAAAAAA ACTGGTAAAA TTACTTTTGG 1440
CAGACAGTGT TTTATGAATT ATGTATCATG TTGATATATA ATATGTTAAT GTGTCATGTA 1500
ATTTTTACTT TGTACAAAGC AAATAAAGAT CTTTCTCAAA AAAAAAAAAA AAAA

SEQ ID NO:152 PFG1 Protein sequence:
Protein Accession #: NP_060376.1

1 11 21 31 41 51
| | | | | |
MELVAGCYEQ VLFGFAVHPE PKACGDHEQW TLVADFTHHA HTASLSAVAV NSRFVVTGSK 60
DETIHIYDMK KKIEHGALVH HSGTITCLKF YGNRHLISGA EDGLICIWDA KKWECLKSIK 120
AHKGQVTFLS IHPSGKLALS VGTDKTLRTW NLVEGRSAFI KNIKQNAHIV EWSPRGEQYV 180
VIIQNKIDIY QLDTASISGT ITNEKRISSV KFLSESVLAV AGDEEVIRFF DCDSLVCLCE 240
FKAHENRVKD MFSFEIPEHH VIVSASSDGF IKMWKLKQDK KVPPSLLCEI NTNARLTCLG 300
VWLDKVADMK SLPPAAEPSP VSKEQSKIGK KEPGDTVHKE EKRSKPNTKK RGLTGDSKKA 360
TKESGLISTK KRKMVEMLEK KRKKKKIKTM Q

SEQ ID NO:153 PFD6 DNA SEQUENCE

Nucleic Acid Accession #: NM_014668
Coding sequence: 110-2953 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
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GATGTCTTGG ACATGCTCTG GCTGGCTAAT CTCCATGTTC TAGCCGACTG AAAATACGGT 60
GGCCAAGTGG ATGGTGTGCT TATTTGCAGT CTAAAGAAAT TTCCTTTTGA TGTGGCAGAA 120
AATCGAGGAT GTGGAGTGGA GACCCCAGAC TTACTTGGAG CTGGAGGGTC TGCCTTGCAT 180
CCTGATCTTC AGTGGGATGG ACCCGCATGG GGAGTCCTTG CCGAGGTCTT TGAGGTACTG 240
TGACCTGCGA TTGATAAACT CCTCCTGCTT GGTGAGAACA GCCTTGGAGC AGGAGCTGGG 300
CCTGGCTGCC TACTTTGTGA GCAACGAGGT TCCCTTGGAG AAGGGGGCTA GGAACGAGGC 360
CTTGGAGAGT GATGCTGAGA AGCTGAGCAG CACAGACAAC GAGGATGAGG AGCTGGGGAC 420
AGAAGGCTCT ACCTCGGAGA AGAGAAGCCC CATGAAAAGG GAGAGGTCCC GCTCCCACGA 480
CTCAGCATCC TCATCCCTCT CCTCCAAGGC TTCCGGTTCA GCGCTCGGTG GCGAGTCCTC 540
GGCTCAGCCC ACAGCACTCC CCCAGGGAGA GCATGCCAGG TCGCCCCAGC CCCGTGGCCC 600
CGCAGAGGAG GGCAGAGCCC CTGGTGAGAA ACAGAGGCCC CGGGCAAGTC AGGGGCCACC 660
CTCGGCCATC AGCAGGCACA GTCCCGGGCC GACGCCCCAG CCCGACTGTA GCCTCAGGAC 720
CGGCCAGAGG AGCGTCCAGG TGTCGGTCAC CTCGTCGTGC TCCCAGCTGT CCTCCTCCTC 780
GGGCTCATCC TCCTCATCCG TGGCGCCCGC TGCCGGCACG TGGGTCCTGC AGGCCTCCCA 840
GTGCTCCTTG ACCAAGGCCT GCCGCCAGCC ACCCATTGTC TTCTTGCCCA AGCTCGTGTA 900
CGACATGGTT GTGTCCACTG ACAGCAGTGG CCTGCCCAAG GCCGCCTCCC TCCTGCCCTC 960
CCCCTCGGTC ATGTGGGCCA GCTCTTTCCG CCCCCTGCTC AGCAAGACCA TGACATCCAC 1020
CGAGCAGTCC CTCTACTACC GGCAGTGGAC GGTGCCCCGG CCCAGCCACA TGGACTACGG 1080
CAACCGGGCC GAGGGCCGCG TGGACGGCTT CCACCCCCGC AGGCTGCTGC TCAGCGGCCC 1140
CCCTCAGATC GGGAAGACAG GTGCCTACCT GCAGTTCCTC AGTGTCCTGT CCAGGATGCT 1200
TGTTCGGCTC ACAGAAGTGG ATGTCTATGA CGAGGAGGAG ATCAATATCA ACCTCAGAGA 1260
AGAATCTGAC TGGCATTATC TCCAGCTTAG CGACCCCTGG CCAGACCTGG AGCTGTTCAA 1320
GAAGTTGCCC TTTGACTACA TCATTCACGA CCCGAAGTAT GAAGATGCCA GCCTGATTTG 1380
TTCGCACTAT CAGGGTATAA AGAGTGAAGA CAGAGGGATG TCCCGGAAGC CGGAGGACCT 1440
TTATGTGCGG CGTCAGACGG CACGGATGAG ACTGTCCAAG TACGCAGCGT ACAACACTTA 1500
CCACCACTGT GAGCAGTGCC ACCAGTACAT GGGCTTCCAC CCCCGCTACC AGCTGTATGA 1560
GTCCACCCTG CACGCCTTTG CCTTCTCTTA CTCCATGCTA GGAGAGGAGA TCCAGCTGCA 1620
CTTCATCATC CCCAAGTCCA AGGAGCACCA CTTTGTCTTC AGCCAACCTG GAGGCCAGCT 1680
GGAGAGCATG CGACTACCCC TCGTGACAGA CAAGAGCCAT GAATATATAA AAAGTCCGAC 1740
ATTCACTCCA ACCACCGGCC GTCACGAACA TGGGCTCTTT AATCTGTACC ACGCAATGGA 1800
CGGTGCCAGC CATTTGCACG TGCTGGTTGT CAAGGAATAC GAGATGGCAA TTTATAAGAA 1860
ATATTGGCCC AACCACATCA TGCTGGTGCT CCCCAGTATC TTCAACAGTG CTGGAGTTGG 1920
TGCTGCTCAT TTCCTCATCA AGGAGCTGTC CTACCATAAC CTGGAGCTCG AGCGGAACCG 1980
GCAGGAGGAG CTGGGAATCA AGCCGCAGGA CATCTGGCCT TTCATTGTGA TCTCTGATGA 2040
CTCCTGCGTG ATGTGGAACG TGGTGGATGT CAACTCTGCT GGGGAGAGAA GCAGGGAGTT 2100
CTCCTGGTCG GAAAGGAACG TGTCTTTGAA GCACATCATG CAGCACATCG AGGCGGCCCC 2160
CGACATCATG CACTACGCCC TGCTGGGCCT GCGGAAGTGG TCCAGCAAGA CCCGGGCCAG 2220
CGAGGTGCAA GAGCCCTTCT CCCGCTGCCA CGTGCACAAC TTCATCATCC TGAACGTGGA 2280
CCTGACCCAG AACGTGCAGT ACAACCAGAA CCGGTTCCTG TGTGACGATG TAGACTTCAA 2340
CCTGCGGGTG CACAGCGCCG GCCTCCTGCT CTGCCGGTTC AACCGCTTCA GCGTGATGAA 2400
GAAGCAGATC GTGGTGGGCG GCCACAGGTC CTTCCACATC ACATCCAAGG TGTCTGATAA 2460
CTCTGCCGCG GTCGTGCCGG CCCAGTACAT CTGTGCCCCG GACAGCAAGC ACACGTTCCT 2520
CGCAGCGCCC GCCCAGCTCC TGCTGGAGAA GTTCCTGCAG CACCACAGCC ACCTCTTCTT 2580
CCCGCTGTCC CTGAAGAACC ATGACCACCC AGTGCTGTCT GTCGACTGTT ACCTGAACCT 2640
GGGATCTCAG ATTTCTGTTT GCTATGTGAG CTCCAGGCCC CACTCTTTAA ACATCAGCTG 2700
CTCGGACTTG CTGTTCAGTG GGCTGCTGCT GTACCTCTGT GACTCTTTTG TGGGAGCTAG 2760
CTTTTTGAAA AAGTTTCATT TTCTGAAAGG TGCGACGTTG TGTGTCATCT GTCAGGACCG 2820
GAGCTCACTG CGCCAGACGG TCGTCCGCCT GGAGCTCGAG GACGAGTGGC AGTTCCGGCT 2880

GCGCGATGAG TTCCAGACCG CCAATGCCAG GGAAGACCGG CCGCTCTTTT TTCTGACGGG 2940
ACGACACATC <u>TGA</u>GGAAGAC AGCGGCGAGT TTTCTGAAGA GATGAGTGCT CAGAGCCCTC 3000
ATGCTGTTGA GGCTAAAGGG AGGCCTGGAA CGGTGGGGCG TTTGACTGGA ATGGACCCCA 3060
GGGACTGTCC AGGTGCAGCC CCTCCTAGTA CACATGGGCC CCCGAGGCCG TGGTCCTGGG 3120
AGCCAGGAAG ACTCCGCAGT GGGTGAGAAT GAAAACTTGA GACTCCCAAG TTCTGGGCCA 3180
GCCCATTGCT CTGGGCTGTT TTAAAGCCCA TTTCACGAGG AACAAAGATT TACTTCCTGT 3240
CCTGCCATTC GTGTGCTTCC ATGGACAAAC CTGATTTTTT TCTCTTAGTT CTAAAGAATC 3300
TTGGGTTATT TTGTAGCGGT GCCAGTATTT CAGTAGATGG GATTTCAGCC AAGTAGGTTC 3360
CCCTGTAACC TCCTACAAAG CAATATTCCA AAGGAACATT TTAACTGTAA AGGCTGGAGA 3420
CAAGAAAAAA TAAGTAGATC GTTTTAATAA CAATTATTTA ATTGCCTATA AGTTTGCTGT 3480
TTCAGAGGCT AGCCCAAAGG CATCAAATTT AATAAAGTTA AACAAATTGA TTTACTTCAG 3540
AGCAAATATG ATCCTATTAA AATAATATAG GGTAAATACC CTACCTCTTA GAAAGGGCAA 3600
AAATGCAAAG AAGCTTTCTT TAAAACTAAA AGGGTTTTTT GGGGGGGGAG TTGGCGGGGA 3660
GGAAATAAGG CTAACAGAGG TTGACCTAAA ATTAGCCTTA CAAAGGAGAA AGGACCACAT 3720
TGCTTACTTG AAACAGACAA TGAAAACAAC CAAAGTGATA TATAAAATAG TTGATGAGAA 3780
CTAGACTTAT GACTGTAGTT TACTAGAGTT TAGTTTTCAG TTGCTGAAGT AGCTCATTTT 3840
CTCTTACTAA TGTTTGGTTC CTCAGGGAAG AATCTCACTT GACTAGAGAG GAGGTGGGAA 3900
CAGAAGAGAG AAGGAGGCAG GGAGATGTAT TTCTTAGGGC TCACCCCTTC ACAGACTGAC 3960
AGAATGGTTT TGTTTTGTTT TGTTTTGTTT TGTTTTGTTT TTGAGATGGA CTCTAGCTCT 4020
GTCACCCAGG CTGGAGTGCA GTGGTGCGAT CTCGGCTCAC TGCAAGCTCC GCCTCCCGGG 4080
TTCTCACCAT TCTCCTGCCT CAGCCTCCCG AGTAGCTGGG ACTACAGGCG CCCACCACCA 4140
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GGTCTCGATC TCCTGACCTC GTGATCCGCC CGCCTCGGCC TCCCAAAGTG CTGGGATTAC 4260
AGGCGTGAGC CACCGTGCCT GCCCCAGAAT GGTTTTTAAA GCCACAGTTG AGAGGCCACC 4320
CATTGCCCGG CGCCTGGACA GTGATCATCT TGTTCATCTT GTTCAGTCCT TTCTTGTGTG 4380
ATTGGAATTA TTCATCCCCT TTGAAAGATG AGAAGGTTGA GATGCAAAGA GTCTACCTTT 4440
CCAAGTTCTC ACTGCTGGAA AGAGCTAGAA GCACAGTTCA AAGTTCTGGC TTCTGGACTC 4500
TGCAGTCCAG GTCTCCCTTC TCCCACTTGC CTACCCTCAA TGCCACACTG TTTTTGAAGT 4560
GGCCCATAAC TTGAAGGAAA AGTTTAAAGA CAGTTCAATT TAATCATCAG AATGCATTCT 4620
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GATCTCGGCT CACTGCAACC TCTGCCTCCT GGGTTCAAGT GATTCTCCAG CCTCAGCCTC 4740
CCGAGTAGCT GGGATTATGG GCGCCCACCA CCATGCCCAG CTAATTTTTG TATTTTTTTT 4800
TTTTAGTAGA GATGGGGTTT CGCCAGGTTG GCCAGGCTGG TCTTGTGAAC TCCTGGCCTC 4860
AGGTGATCTG CCCACCTCAT CCTCCAAAAG TGCTGGGATT ACAGGCATGA GCCACTGCGC 4920
CTGGCCTCAG AATGCATTCT TACACATCTA TCCTAGACAT TTATAAGCAC TCTAATGGAT 4980
AACAATCCAA GAATAAATGA TTGTAAAAGA TGATGCCGAA GAGTTGATGT CAATCTTTTT 5040
TTCCTAAGAA AAAAAGTCCG CGAGTATTAA ATATTTAGAT CAATGTTTAT AAAATGATTA 5100
CTTTGTATAT CTCATTATTC CTATTTTGGA ATAAAAACTG ACCTTCTTTA ATCATATACT 5160
TGTCTTTTGT AAATAGCAGC TTTTGTGTCA TTCTCCCCAC TTTATTAGTT AATTTAAATT 5220
GGAAAAAACC CTCAAACTAA TATTCTTGTC TGTTCCAGTC TTATAAATAA AACTTATAAT 5280
GCATG

<u>SEQ ID NO:154 PFD6 Protein sequence:</u>
Protein Accession #: NP_055483.1

1 11 21 31 41 51
| | | | | |
MWQKIEDVEW RPQTYLELEG LPCILIFSGM DPHGESLPRS LRYCDLRLIN SSCLVRTALE 60
QELGLAAYFV SNEVPLEKGA RNEALESDAE KLSSTDNEDE ELGTEGSTSE KRSPMKRERS 120
RSHDSASSSL SSKASGSALG GESSAQPTAL PQGEHARSPQ PRGPAEEGRA PGEKQRPRAS 180
QGPPSAISRH SPGPTPQPDC SLRTGQRSVQ VSVTSSCSQL SSSSGSSSSS VAPAAGTWVL 240
QASQCSLTKA CRQPPIVFLP KLVYDMVVST DSSGLPKAAS LLPSPSVMWA SSFRPLLSKT 300
MTSTEQSLYY RQWTVPRPSH MDYGNRAEGR VDGFHPRRLL LSGPPQIGKT GAYLQFLSVL 360
SRMLVRLTEV DVYDEEEINI NLREESDWHY LQLSDPWPDL ELFKKLPFDY IIHDPKYEDA 420
SLICSHYQGI KSEDRGMSRK PEDLYVRRQT ARMRLSKYAA YNTYHHCEQC HQYMGFHPRY 480
QLYESTLHAF AFSYSMLGEE IQLHFIIPKS KEHHFVFSQP GGQLESMRLP LVTDKSHEYI 540
KSPTFTPTTG RHEHGLFNLY HAMDGASHLH VLVVKEYEMA IYKKYWPNHI MLVLPSIFNS 600
AGVGAAHFLI KELSYHNLEL ERNRQEELGI KPQDIWPFIV ISDDSCVMWN VVDVNSAGER 660
SREFSWSERN VSLKHIMQHI EAAPDIMHYA LLGLRKWSSK TRASEVQEPF SRCHVHNFII 720
LNVDLTQNVQ YNQNRFLCDD VDFNLRVHSA GLLLCRFNRP SVMKKQIVVG GHRSFHITSK 780
VSDNSAAVVP AQYICAPDSK HTFLAAPAQL LLEKFLQHHS HLFFPLSLKN HDHPVLSVDC 840
YLNLGSQISV CYVSSRPHSL NISCSDLLFS GLLLYLCDSF VGASFLKKFH FLKGATLCVI 900
CQDRSSLRQT VVRLELEDEW QFRLRDEFQT ANAREDRPLF FLTGRHI

SEQ ID NO:155 PFC6 DNA SEQUENCE

Nucleic Acid Accession #: NM_000522
Coding sequence: 1-1167 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
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<u>ATG</u>ACAGCCT CCGTGCTCCT CCACCCCCGC TGGATCGAGC CCACCGTCAT GTTTCTCTAC 60
GACAACGGCG GCGGCCTGGT GGCCGACGAG CTCAACAAGA ACATGGAAGG GGCGGCGGCG 120
GCTGCAGCAG CGGCTGCAGC GGCGGCGGCT GCCGGGGCCG GGGGCGGGGG CTTCCCCCAC 180
CCGGCGGCTG CGGCGGCAGG GGGCAACTTC TCGGTGGCGG CCGCGGCCGC GGCTGCGGCG 240
GCCGCCGCGG CCAACCAGTG CCGCAACCTG ATGGCGCACC CGGCGCCCTT GGCGCCAGGA 300
GCCGCGTCCG CCTACAGCAG CGCCCCCGGG GAGGCGCCCC CGTCGGCTGC CGCCGCTGCT 360

GCCGCGGCTG CCGCTGCAGC CGCCGCCGCC GCCGCCGCGT CGTCCTCGGG AGGTCCCGGC 420
CCGGCGGGCC CGGCGGCGGC AGAGGCGGCC AAGCAATGCA GCCCCTGCTC GGCAGCGGCG 480
CAGAGCTCGT CGGGGCCCGC GGCGCTGCCC TATGGCTACT TCGGCAGCGG CTACTACCCG 540
TGCGCCCGCA TGGGCCCGCC CCCCAACGCC ATCAAGTCGT GCCCCCAGCC CCCCTCGGCC 600
GCCGCCGCCG CCGCCTTCGC GGACAAGTAC ATGGATACCG CCGGCCCAGC TGCCGAGGAG 660
TTCAGCTCCC GCGCTAAGGA GTTCGCGTTC TACCACCAGG GCTACGCAGC CGGGCCTTAC 720
CACCACCATC AGCCCATGCC TGGCTACCTG GATATGCCAG TGGTGCCGGG CCTCGGGGGC 780
CCCGGCGAGT CGCGCCACGA ACCCTTGGGT CTTCCCATGG AAAGCTACCA GCCCTGGGCG 840
CTGCCCAACG GCTGGAACGG CCAAATGTAC TGCCCCAAAG AGCAGGCGCA GCCTCCCCAC 900
CTCTGGAAGT CCACTCTGCC CGACGTGGTC TCCCATCCCT CGGATGCCAG CTCCTATAGG 960
AGGGGGAGAA AGAAGCGCGT GCCTTATACC AAGGTGCAAT TAAAAGAACT TGAACGGGAA 1020
TACGCCACGA ATAAATTCAT TACTAAGGAC AAACGGAGGC GGATATCAGC CACGACGAAT 1080
CTCTCTGAGC GGCAGGTCAC AATCTGGTTC CAGAACAGGA GGGTTAAAGA GAAAAAAGTC 1140
ATCAACAAAC TGAAAACCAC TAGT<u>TAA</u>

SEQ ID NO:156 <u>PFC6 Protein sequence:</u>
Protein Accession #: NP_000513.1

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1         11        21        31        41        51
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MTASVLLHPR WIEPTVMFLY DNGGGLVADE LNKNMEGAAA AAAAAAAAAA AGAGGGGFPH  60
PAAAAAGGNF SVAAAAAAAA AAAANQCRNL MAHPAPLAPG AASAYSSAPG EAPPSAAAAA  120
AAAAAAAAAA AAASSSGGPG PAGPAAAEAA KQCSPCSAAA QSSSGPAALP YGYFGSGYYP  180
CARMGPPPNA IKSCPQPPSA AAAAAFADKY MDTAGPAAEE FSSRAKEFAF YHQGYAAGPY  240
HHHQPMPGYL DMPVVPGLGG PGESRHEPLG LPMESYQPWA LPNGWNGQMY CPKEQAQPPH  300
LWKSTLPDVV SHPSDASSYR RGRKKRVPYT KVQLKELERE YATNKFITKD KRRRISATTN  360
LSERQVTIWF QNRRVKEKKV INKLKTTS
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SEQ ID NO:157 PFA3 DNA SEQUENCE

Nucleic Acid Accession #: AW102723
Coding sequence: 523-2676 (underlined sequences correspond to start and stop codons)

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1         11        21        31        41        51
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CCCTTATGGC GATTGGGCGG CTGCAGAGAC CAGGACTCAG TTCCCCTGCC CTAGTCTGAG  60
CCTAGTGGGT GGGACTCAGC TCAGAGTCAG TTTTCAGAAG CAGGTTTCAG TTGCAGAGTT  120
TTCCTACACT TTTCCTGCGC TAGAGCAGCG AGCAGCCTGG AACAGACCCA GGCGGAGGAC  180
ACCTGTGGGG GAGGGAGCGC CTGGAGGAGC TTAGAGACCC CAGCCGGGCG TGATCTCACC  240
ATGTGCGGAT TTGCGAGGCG CGCCCTGGAG CTGCTAGAGA TCCGGAAGCA CAGCCCCGAG  300
GTGTGCGAAG CCACCAAGAC TGCGGCTCTT GGAGAAAGCG TGAGCAGGGG GCCACCGCGG  360
TCTCCGGCCT GTCTGCACCC TGTCGCCTGA GCTGCCTGAC AGTGACAATG ACATCCCAGT  420
TACCAGTGTC CTTGAATTGA TAGTGGCTTC TGTTTGTCAG TCTCATATAA GAACTACAGC  480
TCATCAGGAG GAGATCGCAG CAGGGTAAGA GACACCAACA CCATGTTCTG CACGAAGCTC  540
AAGGATCTCA AGATCACAGG AGAGTGTCCT TTCTCCTTAC TGGCACCAGG TCAAGTTCCT  600
AACGAGTCTT CAGAGGAGGC AGCAGGAAGC TCAGAGAGCT GCAAAGCAAC CGTGCCCATC  660
TGTCAAGACA TTCCTGAGAA GAACATACAA GAAAGTCTTC CTCAAAGAAA AACCAGTCGG  720
AGCCGAGTCT ATCTTCACAC TTTGGCAGAG AGTATTTGCA AACTGATTTT CCCAGAGTTT  780
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ATGAAAACAT CCTTGGGGTG GTTGGAGGCA CCCTTAAAGA TTTTTAAACA GCTTCAGTAC  1020
CCTTCTGAAA CAGAGCAGCC ATTGCCAAGA AGCAGGAAAA AGGGGCAGCT TGAGGACGCC  1080
TCCATTCTAT GCCTGGATAA GGAGGATGAT TTTCTACATG TTTACTACTT CTTCCCTAAG  1140
AGAACCACCT CCCTGATTCT TCCCGGCATC ATAAAGGCAG CTGCTCACGT ATTATATGAA  1200
ACGGAAGTGG AAGTGTCGTT AATGCCTCCC TGCTTCCATA ATGATTGCAG CGAGTTTGTG  1260
AATCAGCCCT ACTTGTTGTA CTCCGTTCAC ATGAAAAGCA CCAAGCCATC CCTGTCCCCC  1320
AGCAAACCCC AGTCCTCGCT GGTGATTCCC ACATCGCTAT TCTGCAAGAC ATTTCCATTC  1380
CATTTCATGT TTGACAAAGA TATGACAATT CTGCAATTTG GCAATGGCAT CAGAAGGCTG  1440
ATGAACAGGA GAGACTTTCA AGGAAAGCCT AATTTTGAAT ACTTTGAAAT TCTGACTCCA  1500
AAAATCAACC AGACCTTTAG CGGGATCATG ACTATGTTGA ATATGCAGTT TGTTGTACGA  1560
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GGGAAGCTGA AGGCTACCCT TGAGCAAGCC CACCAAGCCC TGGAGGAGGA GAAGAAAAAG  1860
ACAGTAGACC TTCTGTGCTC CATATTTCCC TGTGAGGTTG CTCAGCAGCT GTGGCAAGGG  1920
CAAGTTGTGC AAGCCAAGAA GTTCAGTAAT GTCACCATGC TCTTCTCAGA CATCGTTGGG  1980
TTCACTGCCA TCTGCTCCCA GTGCTCACCG CTGCAGGTCA TCACCATGCT CAATGCACTG  2040
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GCGCTGATGG CCCTGAAGAT GATGGAGCTC TCTGATGAAG TTATGTCTCC CCATGGAGAA  2220
CCTATCAAGA TGCGAATTGG ACTGCACTCT GGATCAGTTT TTGCTGGCGT CGTTGGAGTT  2280
AAAATGCCCC GTTACTGTCT TTTTGGAAAC AATGTCACTC TGGCTAACAA ATTTGAGTCC  2340
TGCAGTGTAC CACGAAAAAT CAATGTCAGC CCAACAACTT ACAGATTACT CAAAGACTGT  2400
CCTGGTTTCG TGTTTACCCC TCGATCAAGG GAGGAACTTC CACCAAACTT CCCTAGTGAA  2460
ATCCCCGGAA TCTGCCATTT TCTGGATGCT TACCAACAAG GAACAAACTC AAAACCATGC  2520
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TTCCAAAAGA AAGATGTGGA AGATGCAAGC CAATTTTTTA GGCAAAGCAT CAGGAATAGA 2580
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GCCTCTGAAA GCACTTTAGG GATTGTAGAT GGCTAACAAG CAGTATTAAA ATTTCAGGAG 2700
CCAAGTCACA ATCTTTCTCC TGTTTAACAT GACAAAATGT ACTCACTTCA GTACTTCAGC 2760
TCTTCAAGAA AAAAAAAAAA ACCTTAAAAA GCTACTTTTG TGGGAGTATT TCTATTATAT 2820
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AGTCAATTGT ACAAACTGAT GGAGTCACCT GCAATCTCAT ATCCTGGTGG AATGCCATGG 2940
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SEQ ID NO:158 PFA3 Protein sequence:
Protein Accession #: NP_000847.1

1 11 21 31 41 51
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MFCTKLKDLK ITGECPFSLL APGQVPNESS EEAAGSSESC KATVPICQDI PEKNIQESLP 60
QRKTSRSRVY LHTLAESICK LIFPEFERLN VALQRTLAKH KIKESRKSLE REDFEKTIAE 120
QAVQQSPVEL SKNLLVKRFL KYVTRKMKTS LGWLEAPLKI FKQLQYPSET EQPLPRSRKK 180
GQLEDASILC LDKEDDFLHV YYFFPKRTTS LILPGIIKAA AHVLYETEVE VSLMPPCFHN 240
DCSEFVNQPY LLYSVHMKST KPSLSPSKPQ SSLVIPTSLF CKTFPFHFMF DKDMTILQFG 300
NGIRRLMNRR DFQGKPNFEY FEILTPKINQ TFSGIMTMLN MQFVVRVRRW DNSVKKSSRV 360
MDLKGQMIYI VESSAILFLG SPCVDRLEDF TGRGLYLSDI PIHNALRDVV LIGEQARAQD 420
GLKKRLGKLK ATLEQAHQAL EEEKKKTVDL LCSIFPCEVA QQLWQGQVVQ AKKFSNVTML 480
FSDIVGFTAI CSQCSPLQVI TMLNALYTRF DQQCGELDVY KVETIAMPIV WLGGLHKESD 540
THAVQIALMA LKMMELSDEV MSPHGEPIKM RIGLHSGSVF AGVVGVKMPR YCLFGNNVTL 600
ANKFESCSVP RKINVSPTTY RLLKDCPGFV FTPRSREELP PNFPSEIPGI CHFLDAYQQG 660
TNSKPCFQKK DVEDASQFFR QSIRNRLATY IPIYKSLGFD SLKMCRASES TLGIVDG

SEQ ID NO:159 PFA1 DNA SEQUENCE

Nucleic Acid Accession #: NM_004362
Coding sequence: 102-1934 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
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CGCCGGCGGG ACTGGTCTGA AGAGACGCGG GGACAAAGTG GCAACGACTT GGACATCTGA 60
GCTGTCACTG CCGAAAACAG GCCGCAAGAG AGATAATCAA TATGCATTTC CAAGCCTTTT 120
GGCTATGTTT GGGTCTTCTG TTCATCTCAA TTAATGCAGA ATTTATGGAT GATGATGTTG 180
AGACGGAAGA CTTTGAAGAA AATTCAGAAG AAATTGATGT TAATGAAAGT GAACTTTCCT 240
CAGAGATTAA ATATAAGACA CCTCAACCTA TAGGAGAAGT ATATTTTGCA GAAACTTTTG 300
ATAGTGGAAG GTTGGCTGGA TGGGTCTTAT CAAAAGCAAA GAAAGATGAC ATGGATGAGG 360
AAATTTCAAT ATACGATGGA AGATGGGAAA TTGAAGAGTT GAAAGAAAAC CAGGTACCTG 420
GTGACAGAGG ACTGGTATTA AAATCTAGAG CAAAGCATCA TGCAATATCT GCTGTATTAG 480
CAAAACCATT CATTTTTGCT GATAAACCCT TGATAGTTCA ATATGAAGTA AATTTTCAAG 540
ATGGTATTGA TTGTGGAGGT GCATACATTA AACTCCTAGC AGACACTGAT GATTTGATTC 600
TGGAAAACTT TTATGATAAA ACATCCTATA TCATTATGTT TGGACCAGAT AAATGTGGAG 660
AAGATTATAA ACTTCATTTT ATCTTCAGAC ATAAACATCC CAAAACTGGA GTTTTCGAAG 720
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ATCTTTATAC CCTTGTGATG AATCCAGATG ACACATTTGA GGTGTTAGTT GATCAAACAG 840
TTGTAAACAA AGGAAGCCTC CTAGAGGATG TGGTTCCTCC TATCAAACCT CCCAAAGAAA 900
TTGAAGATCC CAATGATAAA AAACCTGAGG AATGGGATGA AAGAGCAAAA ATTCCTGATC 960
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GTGTTGTTAA ACCTGCTGGC TGGCTTGATG ATGAACCAAA ATTTATCCCT GATCCTAATG 1080
CTGAAAAACC TGATGACTGG AATGAAGACA CGGATGGAGA ATGGGAGGCA CCTCAGATTC 1140
TTAATCCAGC ATGTCGGATT GGGTGTGGTG AGTGGAAACC TCCCATGATA GATAACCCAA 1200
AATACAAAGG AGTATGGAGA CCTCCACTGG TCGATAATCC TAACTATCAG GGAATCTGGA 1260
GTCCTCGAAA AATTCCTAAT CCAGATTATT TCGAAGATGA TCATCCATTT CTTCTGACTT 1320
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TTATTATCTG TTCGGAAAAG GAAGTAGCAG ATCACTGGGC TGCAGATGGT TGGAGATGGA 1440
AAATAATGAT AGCAAATGCT AATAAGCCTG GTGTATTAAA ACAGTTAATG GCAGCTGCTG 1500
AAGGGCACCC ATGGCTTTGG TTGATTTATC TTGTGACAGC AGGAGTGCCA ATAGCATTAA 1560
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AAACCGACAT ATGTATACCA CAAACAAAAG GAGTACTAGA GCAAGAAGAA AAGGAAGAGA 1680
AAGCAGCCCT GGAAAAACCA ATGGACCTGG AAGAGGAAAA AAAGCAAAAT GATGGTGAAA 1740
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TAGAAGGGCA AGAAGAAAGT AATCAATCAA ATAAGTCTGG GTCAGAGGAT GAGATGAAAG 1860
AAGCAGATGA GAGCACAGGA TCTGGAGATG GGCCGATAAA GTCAGTACGC AAAAGAAGAG 1920
TACGAAAGGA CTAAACTAGA TTGAAATATT TTTAATTCCC GAGAGGATGT TTGGCATTGT 1980
AAAAATCAGC ATGCCAGACC TGAACTTTAA TCAGTCTGCA CATCCTGTTT CTAATATCTA 2040
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AAGAGATTAA TACCATTAGA AGTTACACAG TTTTAGTTGT TTGGAGATAG TTTTGGTTTG 2220
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TCCACTTAAA TGGCTATACA ACAATATAAC TGGTAGTTCT ATAATAAAAA TGAGCATATG 2340
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AGTTGTTTGC TTAAATTATA GATTCCTTTA AGGACATGCC TTGTTCATAA AATCACTGGA 2520

TTATATTGCA GCATATTTTA CATTTGAATA CAAGGATAAT GGGTTTTATC AAAACAAAAT 2580
GATGTACAGA TTTTTTTTCA AGTTTTTATA GTTGCTTTAT GCCAGAGTGG TTTACCCCAT 2640
TCACAAAATT TCTTATGCAT ACATTGCTAT TGAAAATAAA ATTTAAATAT TTTTTCATCC 2700
TGAAAAAAAA

SEQ ID NO:160 PFA1 Protein sequence:
Protein Accession #: NP_004353.1

1 11 21 31 41 51

MHFQAFWLCL GLLFISINAE FMDDDVETED FEENSEEIDV NESELSSEIK YKTPQPIGEV 60
YFAETFDSGR LAGWVLSKAK KDDMDEEISI YDGRWEIEEL KENQVPGDRG LVLKSRAKHH 120
AISAVLAKPF IFADKPLIVQ YEVNFQDGID CGGAYIKLLA DTDDLILENF YDKTSYIIMF 180
GPDKCGEDYK LHFIFRHKHP KTGVFEEKHA KPPDVDLKKF FTDRKTHLYT LVMNPDDTFE 240
VLVDQTVVNK GSLLEDVVPP IKPPKEIEDP NDKKPEEWDE RAKIPDPSAV KPEDWDESEP 300
AQIEDSSVVK PAGWLDDEPK FIPDPNAEKP DDWNEDTDGE WEAPQILNPA CRIGCGEWKP 360
PMIDNPKYKG VWRPPLVDNP NYQGIWSPRK IPNPDYFEDD HPFLLTSFSA LGLELWSMTS 420
DIYFDNFIIC SEKEVADHWA ADGWRWKIMI ANANKPGVLK QLMAAAEGHP WLWLIYLVTA 480
GVPIALITSF CWPRKVKKKH KDTEYKKTDI CIPQTKGVLE QEEKEEKAAL EKPMDLEEEK 540
KQNDGEMLEK EEESEPEEKS EEEIEIIEGQ EESNQSNKSG SEDEMKEADE STGSGDGPIK 600
SVRKRRVRKD

SEQ ID NO:161 PEZ9 DNA SEQUENCE

Nucleic Acid Accession #: NM_005932
Coding sequence: 75-2216 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51

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CTCTGCCGCC CCGCCGGGCG GGCCGGGGAA GCCTCGAAGC CGGGATCCGG GCCCGAAGGG 180
TCAGCACCAG CTGGTCTCCC GTGGGCGCCG CCTTCAATGT CAAGCCCCAG GGCAGCCGCT 240
TGGACCTGTT CGGCGAGCGG GCGCGTCTTT TTGGAGTTCC TGAGCTGAGT GCCCCAGAAG 300
GATTTCATAT TGCACAAGAA AAAGCCTTGA GAAAGACAGA ATTGCTTGTG GACCGTGCAT 360
GTTCCACCCC ACCTGGGCCC CAGACCGTGC TGATCTTCGA TGAGCTCTCG GATTCCTTAT 420
GCAGAGTGGC CGACTTGGCT GATTTTGTGA AAATCGCTCA CCCTGAGCCA GCATTCAGAG 480
AAGCTGCGGA AGAAGCTTGT AGAAGTATTG GCACCATGGT AGAGAAGTTG AACACAAATG 540
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ATCCAGAAAC AAGGCGAGTG GCTGAACTGT TTATGTTTGA TTTTGAAATT AGTGGAATCC 660
ATCTAGACAA ACAAAAGCGT AAAAGAGCAG TGGACCTCAA TGTTAAAATC TTGGATTTGA 720
GTAGTACATT TCTTATGGGA ACCAATTTTC CCAACAAGAT TGAGAAGCAT CTCTTACCAG 780
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CTGGTCAATT GAAATGTTTA GAAGAATTGC TCAGCAGCAG AGATCTTCTG GCAAAGTTGG 960
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CTGTCATGCA GTTCCTTGAA AAACTATCTG ACAAACTTTC TGAAAGAACT CTGAAAGATT 1080
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GTTCCTCAAG GAGTTCTCCA ACTTTGCTAA CTCCTGGCAT GATGGAAAAT CTTTTCCATG 1560
AAATGGGACA TGCCATGCAT TCAATGCTAG GACGTACTCG TTACCAACAC GTCACTGGGA 1620
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ATTATCGAGT AGTTAACCAA TTTGCCAGAC ATTATCAGAC TGGACAGCCA CTGCCAAAAA 1740
ATATGGTGTC TCGTCTTTGT GAATCTAAAA AGGTTTGTGC TGCAGCTGAT ATGCAACTTC 1800
AGGTCTTTTA TGCCACTCTG GATCAAATCT ACCATGGGAA GCATCCCCTG AGGAATTCAA 1860
CCACAGACAT TCTCAAGGAA ACACAAGAGA AATTCTATGG CCTACCATAT GTTCCAAATA 1920
CTGCCTGGCA GCTGCGATTC AGCCACCTCG TGGGGTATGG TGCTAGATAT TACTCTTACC 1980
TCATGTCCAG AGCGGTCGCC TCCATGGTTT GGAAGGAGTG TTTTCTACAG GATCCTTTCA 2040
ACAGGGCTGC CGGGGAGCGC TATCGCAGGG AGATGCTGGC CCACGGTGGA GGCAGGGAGC 2100
CCATGCTCAT GGTTGAAGGT ATGCTTCAGA AGTGTCCTTC TGTTGATGAC TTCGTAAGTG 2160
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AACACTCTAC ACCTCTAATC AAGGTCATGT AGTAATGACT TTGTTATAAA TGCTACAGCT 2280
GTGAGAGCTT GTTTCTGATT GTTTCATTGT TCGCTTCTGT AATTCTGAAA AACTTTAAAC 2340
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SEQ ID NO:162 PEZ9 Protein sequence:
Protein Accession #: NP_005923.1

1 11 21 31 41 51

MLCVGRLGGL GARAAALPPR RAGRGSLEAG IRARRVSTSW SPVGAAFNVK PQGSRLDLFG 60
ERARLFGVPE LSAPEGFHIA QEKALRKTEL LVDRACSTPP GPQTVLIFDE LSDSLCRVAD 120

LADFVKIAHP EPAFREAAEE ACRSIGTMVE KLNTNVDLYQ SLQKLLADKK LVDSLDPETR 180
RVAELFMFDF EISGIHLDKQ KRKRAVDLNV KILDLSSTFL MGTNFPNKIE KHLLPEHIRR 240
NFTSAGDHII IDGLHAESPD DLVREAAYKI FLYPNAGQLK CLEELLSSRD LLAKLVGYST 300
FSHRALQGTI AKNPETVMQF LEKLSDKLSE RTLKDFEMIR GMKMKLNAQN SEVMPWDPPY 360
YSGVIRAERY NIEPSLYCPF FSLGACMEGL NILLNRLLGI SLYAEQPAKG EVWSEDVRKL 420
AVVHESEGLL GYIYCDFFQR ADKPHQDCHF TIRGGRLKED GDYQLPLVVL MLNLPRSSRS 480
SPTLLTPGMM ENLFHEMGHA MHSMLGRTRY QHVTGTRCPT DFAEVPSILM EYFANDYRVV 540
NQFARHYQTG QPLPKNMVSR LCESKKVCAA ADMQLQVFYA TLDQIYHGKH PLRNSTTDIL 600
KETQEKFYGL PYVPNTAWQL RFSHLVGYGA RYYSYLMSRA VASMVWKECF LQDPFNRAAG 660
ERYRREMLAH GGGREPMLMV EGMLQKCPSV DDFVSALVSD LDLDFETFLM DSE

SEQ ID NO:163 PEZ8 DNA SEQUENCE

Nucleic Acid Accession #: AF103907
Coding sequence: none (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
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GAATTACAAC ACATATACTT AGTGTTTCAA TGAACACCAA GATAAATAAG TGAAGAGCTA 180
GTCCGCTGTG AGTCTCCTCA GTGACACAGG GCTGGATCAC CATCGACGGC ACTTTCTGAG 240
TACTCAGTGC AGCAAAGAAA GACTACAGAC ATCTCAATGG CAGGGGTGAG AAATAAGAAA 300
GGCTGCTGAC TTTACCATCT GAGGCCACAC ATCTGCTGAA ATGGAGATAA TTAACATCAC 360
TAGAAACAGC AAGATGACAA TATAATGTCT AAGTAGTGAC ATGTTTTTGC ACATTTCCAG 420
CCCCTTTAAA TATCCACACA CACAGGAAGC ACAAAAGGAA GCACAGAGAT CCCTGGGAGA 480
AATGCCCGGC CGCCATCTTG GGTCATCGAT GAGCCTCGCC CTGTGCCTGG TCCCGCTTGT 540
GAGGGAAGGA CATTAGAAAA TGAATTGATG TGTTCCTTAA AGGATGGGCA GGAAAACAGA 600
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CATTACCAAT GAGAGGAAAA CAGACGAGAA AATCTTGATG GCTTCACAAG ACATGCAACA 720
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GGGAATGTTT ATGGGGCACG TTTGTAAGCC TGGGATGTGA AGCAAAGGCA GGGAACCTCA 1800
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CACAGAATTC ATGCAGTGCA AATCCCCAAA GGTAACCTTT ATCCATTTCA TGGTGAGTGC 1920
GCTTTAGAAT TTTGGCAAAT CATACTGGTC ACTTATCTCA ACTTTGAGAT GTGTTTGTCC 1980
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GTGTGTGTGT GAGTGTACAT GCCAAAGTGT GCCTCTCTCT CTTGACCCAT TATTTCAGAC 2160
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GAGAGGATTC AGACAGCTCA GGTGCTTTCA CTAATGTCTC TGAACTTCTG TCCCTCTTTG 2580
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CTGGTCAAAA GGAACCAAGA TACAAAGAAC TCTGAGCTGT CATCGTCCCC ATCTCTGTGA 2760
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GACACATATT AGCTTCTAGC CTTTGCTTCC ACGACTTTTA TCTTTTCTCC AACACATCGC 2940
TTACCAATCC TCTCTCTGCT CTGTTGCTTT GGACTTCCCC ACAAGAATTT CAACGACTCT 3000
CAAGTCTTTT CTTCCATCCC CACCACTAAC CTGAATGCCT AGACCCTTAT TTTTATTAAT 3060
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CAAGAGGTTC AAAATCCAAC TCATTATCTT CTCTTTCTTT CACCTCCCTG CTCCTCTCCC 3180
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CCTCATGGGT GGAGGGGACC ACTCCTGGGC CTTCGTGATT GTCAGGAGCA AGACCTGAGA 3360
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PEZ6 Protein sequence:
Protein Accession #: none

SEQ ID NO:164 PEZ6 DNA SEQUENCE

Nucleic Acid Accession #: AB028945
Coding sequence: 1-3765 (underlined sequences correspond to start and stop codons)

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AAAGAAAAAA AAAAAAAAAA AAAAAAAA

SEQ ID NO:165 PEZ6 Protein sequence:
Protein Accession #: BAA82974.1

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GNHLVLKVVT VTRNLDPDDT ARKKAPPPPK RAPTTALTLR SKSMTSELEE LVDKDKPEEI  180
VPASKPSRAA ENMAVEPRVA TIKQRPSSRC FPAGSDMNSV YERQGIAVMT PTVPGSPKAP  240
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SEQ ID NO:166 PEZ4 DNA SEQUENCE

Nucleic Acid Accession #: NM_000024
Coding sequence: 220-1461 (underlined sequences correspond to start and stop codons)

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SEQ ID NO:167 PEZ4 Protein sequence:
Protein Accession #: NP_000015.1

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IETLCVIAVD RYFAITSPFK YQSLLTKNKA RVIILMVWIV SGLTSFLPIQ MHWYRATHQE 180
AINCYANETC CDFFTNQAYA IASSIVSFYV PLVIMVFVYS RVFQEAKRQL QKIDKSEGRF 240
HVQNLSQVEQ DGRTGHGLRR SSKFCLKEHK ALKTLGIIMG TFTLCWLPFF IVNIVHVIQD 300
NLIRKEVYIL LNWIGYVNSG FNPLIYCRSP DFRIAFQELL CLRRSSLKAY GNGYSSNGNT 360
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SEQ ID NO:168 PEZ1 DNA SEQUENCE

Nucleic Acid Accession #: NM_004457
Coding sequence: 143-2305 (underlined sequences correspond to start and stop codons)

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ACCACAGACT TTAGCAGATC AGTCTTCAAA AATTAAAAAA GGAAGCAAAG GGGATACATC 1260
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TTTCCGGAAA GTTCGAAGCT TGCTAGGGGG AAATATTCGT CTCCTGTTGT GTGGTGGCGC 1500
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AGGTGGATAC TTTAATACTG ATAAGCCACA CCCCAGGGGT GAAATTCTTA TTGGGGGCCA 1740
AAGTGTGACA ATGGGGTACT ACAAAAATGA AGCAAAAACA AAAGCTGATT TCTCTGAAGA 1800
TGAAAATGGA CAAAGGTGGC TCTGTACTGG GGATATTGGA GAGTTTGAAC CCGATGGATG 1860
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TCTTGGGAAA GTAGAGGCAG CTTTGAAGAA TCTTCCACTA GTAGATAACA TTTGTGCATA 1980
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GTTTGAAATT CCAGTAAAAA TTCGTTTGAG TCCTGAACCG TGGACCCCTG AAACTGGTCT 2220
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GAATATTTCG TTGACTATAT GTACATTGAG TTATCTATAT TTGTAAACAA ATTAGTCATG 3240
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ATATCTGGAT TATCAAAAGC AATAGTGCAC CAATTAAGAT GTGCTCAAAT CAGGACTTAA 3660
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SEQ ID NO:169 PEZ1 Protein sequence:
Protein Accession #: NP_004448.1

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GKIFKKVILG QYNWLSYEDV FVRAFNFGNG LQMLGQKPKT NIAIFCETRA EWMIAAQACF 180
MYNFQLVTLY ATLGGPAIVH ALNETEVTNI ITSKELLQTK LKDIVSLVPR LRHIITVDGK 240
PPTWSDFPKG IIVHTMAAVE ALGAKASMEN QPHSKPLPSD IAVIMYTSGS TGLPKGVMIS 300
HSNIIAGITG MAERIPELGE EDVYIGYLPL AHVLELSAEL VCLSHGCRIG YSSPQTLADQ 360
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SKGRNTPLCD SFVFRKVRSL LGGNIRLLLC GGAPLSATTQ RFMNICFCCP VGQGYGLTES 480
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KNEAKTKADF SEDENGQRWL CTGDIGEFEP DGCLKIIDRK KDLVKLQAGE YVSLGKVEAA 600
LKNLPLVDNI CAYANSYHSY VIGFVVPNQK ELTELARKKG LKGTWEELCN SCEMENEVLK 660
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SEQ ID NO:170 PCQ7 DNA SEQUENCE
Nucleic Acid Accession #: none found
Coding sequence: 38-1075(underlined sequence corresponds to start and stop codon)

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GTGTGACGGG CTGCCTGACT GCTTCGACAA GAGTGATGAG AAGGAGTGCC CCAAGGCTAA 240
GTCGAAATGT GGCCCAACCT TCTTCCCCTG TGCCAGCGGC ATCCATTGCA TCATTGGTCG 300
CTTCCGGTGC AATGGGTTTG AGGACTGTCC CGATGGCAGC GATGAAGAGA ACTGCACAGC 360
AAACCCTCTG CTTTGCTCCA CCGCCCGCTA CCACTGCAAG AACGGCCTCT GTATTGACAA 420
GAGCTTCATC TGCGATGGAC AGAATAACTG TCAAGACAAC AGTGATGAGG AAAGCTGTGA 480
AAGTTCTCAA GAACCCGGCA GTGGGCAGGT GTTTGTGACT TCAGAGAACC AACTTGTGTA 540
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CCTGCTGGCA CTGGTCTTGC ACCACCAGCG GAAGCGGAAC AACCTCATGA CGCTGCCCGT 660
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CGACCTGCCC CCCTACCGCT CCCGGTCCGG GAGTGCCAAC AGTGCCAGCT CCCAGGCAGC 960
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GAGCCCCTCC CATGAGTTTA TCCAAGTTCT CAGCTCCTAA AATGCAGGCT GCCAAGACCC 1860
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CATTTCATCT CCTGTGAGTC AGAAGGGCTT TATTTCTCCC TTTGATGGGG CCCCTTCTTC  3180
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SEQ ID NO:171 PCQ7 Protein sequence:
Protein Accession #: none found

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EKECPKAKSK CGPTFFPCAS GIHCIIGRFR CNGFEDCPDG SDEENCTANP LLCSTARYHC   120
KNGLCIDKSF ICDGQNNCQD NSDEESCESS QEPGSGQVFV TSENQLVYYP SITYAIIGSS   180
VIFVLVVALL ALVLHHQRKR NNLMTLPVHR LQHPVLLSRL VVLDHPHHCN VTYNVNNGIQ   240
YVASQAEQNA SEVGSPPSYS EALLDQRPAW YDLPPPPYSS DTESLNQADL PPYRSRSGSA   300
NSASSQAASS LLSVEDTSHS PGQPGPQEGT AEPRDSEPSQ GTEEV
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SEQ ID NO:172 PEL3 DNA SEQUENCE
Nucleic Acid Accession #: NM_005656.1
Coding sequence: 57-1535 (underlined sequences correspond to start and stop codons)

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CTCAGTACTA CCCGTCCCCC GTGCCCCAGT ACGCCCCGAG GGTCCTGACG CAGGCTTCCA   240
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CATCTCAGAG GAAGTCCTGG CACCCTGTGT GCCAAGACGA CTGGAACGAG AACTACGGGC   600
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GAGGCTCCAT CATCACCCCC GAGTGGATCG TGACAGCCGC CCACTGCGTG GAAAAACCTC   960
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TCCCCAGCCT ACTTCACAAG GGGATTTTGC TGATGGGTTC TTAGAGCCTT AGCAGCCCTG  2040
GATGGTGGCC AGAAATAAAG GGACCAGCCC TTCATGGGTG GTGACGTGGT AGTCACTTGT  2100
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SEQ ID NO:173 PEL3 Protein sequence:
Protein Accession #: NP_005647.1

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SNPVVCTQPK SPSGTVCTSK TKKALCITLT LGTFLVGAAL AAGLLWKFMG SKCSNSGIEC 120
DSSGTCINPS NWCDGVSHCP GGEDENRCVR LYGPNFILQM YSSQRKSWHP VCQDDWNENY 180
GRAACRDMGY KNNFYSSQGI VDDSGSTSFM KLNTSAGNVD IYKKLYHSDA CSSKAVVSLR 240
CLACGVNLNS SRQSRIVGGE SALPGAWPWQ VSLHVQNVHV CGGSIITPEW IVTAAHCVEK 300
PLNNPWHWTA FAGILRQSFM FYGAGYQVQK VISHPNYDSK TKNNDIALMK LQKPLTFNDL 360
VKPVCLPNPG MMLQPEQLCW ISGWGATEEK GKTSEVLNAA KVLLIETQRC NSRYVYDNLI 420
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SEQ ID NO:174 PBJ4 DNA SEQUENCE
Nucleic Acid Accession #: AI694767
Coding sequence: 130-1086 (underlined sequences correspond to start and stop codons)

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ATAGGCCTCC CTGGTTTAGA AGAGGCTCAG TTCTGGTTGG CCTTCCCATT GTGCTCCCTC 240
TACCTTATTG CTGTGCTAGG TAACTTGACA ATCATCTACA TTGTGCGGAC TGAGCACAGC 300
CTGCATGAGC CCATGTATAT ATTTCTTTGC ATGCTTTCAG GCATTGACAT CCTCATCTCC 360
ACCTCATCCA TGCCCAAAAT GCTGGCCATC TTCTGGTTCA ATTCCACTAC CATCCAGTTT 420
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AATGTCGTCT ATGGCCTTAT CGTCATCATC TCCGCCATTG GCCTGGACTC ACTTCTCATC 780
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SEQ ID NO:175 PBJ4 PROTEIN SEQUENCE

Protein Accession #: not available, cloned at Eos

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1          11         21         31         41         51
|          |          |          |          |          |
MVDPNGNESS ATYFILIGLP GLEEAQFWLA FPLCSLYLIA VLGNLTIIYI VRTEHSLHEP   60
MYIFLCMLSG IDILISTSSM PKMLAIFWFN STTIQFDACL LQMFAIHSLS GMESTVLLAM  120
AFDRYVAICH PLRHATVLTL PRVTKIGVAA VVRGAALMAP LPVFIKQLPF CRSNILSHSY  180
CLHQDVMKLA CDDIRVNVVY GLIVIISAIG LDSLLISFSY LLILKTVLGL TREAQAKAFG  240
TCVSHVCAVF IFYVPFIGLS MVHRFSKRRD SPLPVILANI YLLVPPVLNP IVYGVKTKEI  300
RQRILRLFHV ATHASEP
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SEQ ID NO:176 PM72 DNA SEQUENCE

Nucleic Acid Accession #: NM_004624.1

Coding sequence: 57-1544 (underlined sequences correspond to start and stop codons)

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TCGGAGCCTG CGGAGGGTGG TGGTGGTGGT GGTGGTGGCC CTCGCCCGCC TCACTCATGC    60
CTCCTCCTCC TCTGCTCTCG CTCAGGCGCC TCGGTGGCGG TTGGTCGGCG GTTACGCGGC   120
TGGTGGTCGC GGCGGCCGGG GCTCGCTCTC GGGGAGGCCG GGGCGGATCT CGCGGCGCAG   180
GCGGCGGCGG CCGAGGTGGG GTCGCGCGGC GGAGGCGGCT CGAGCTTCGT GCTGCGCGCT   240
CGCTCTTGGG CTCCTCGCTG CAGGAGGAGT GTGACTATGT GCAGATGATC GAGGTGCAGC   300
ACAAGCAGTG CCTGGAGGAG GCCCAGCTGG AGAATGAGAC AATAGGCTGC AGCAAGATGT   360
GGGACAACCT CACCTGCTGG CCAGCCACCC CTCGGGGCCA GGTAGTTGTC TTGGCCTGTC   420
CCCTCATCTT CAAGCTCTTC TCCTCCATTC AAGGCCGCAA TGTAAGCCGC AGCTGCACCG   480
ACGAAGGCTG GACGCACCTG GAGCCTGGCC CGTACCCCAT TGCCTGTGGT TTGGATGACA   540
AGGCAGCGAG TTTGGATGAG CAGCAGACCA TGTTCTACGG TTCTGTGAAG ACCGGCTACA   600
CCATTGGCTA CGGCCTGTCC CTCGCCACCC TTCTGGTCGC CACAGCTATC CTGAGCCTGT   660
TCAGGAAGCT CCACTGCACG CGGAACTACA TCCACATGCA CCTCTTCATA TCCTTCATCC   720
TGAGGGCTGC CGCTGTCTTC ATCAAAGACT TGGCCCTCTT CGACAGCGGG GAGTCGGACC   780
AGTGCTCCGA GGGCTCGGTG GGCTGTAAGG CAGCCATGGT CTTTTTCCAA TATTGTGTCA   840
TGGCTAACTT CTTCTGGCTG CTGGTGGAGG GCCTCTACCT GTACACCCTG CTTGCCGTCT   900
CCTTCTTCTC TGAGCGGAAG TACTTCTGGG GGTACATACT CATCGGCTGG GGGGTACCCA   960
GCACATTCAC CATGGTGTGG ACCATCGCCA GGATCCATTT TGAGGATTAT GGTCTGCTCA  1020
GGTGCTGGGA CACCATCAAC TCCTCACTGT GGTGGATCAT AAAGGGCCCC ATCCTCACCT  1080
CCATCTTGGT AAACTTCATC CTGTTTATTT GCATCATCCG AATCCTGCTT CAGAAACTGC  1140
GGCCCCCAGA TATCAGGAAG AGTGACAGCA GTCCATACTC AAGGCTAGCC AGGTCCACAC  1200
TCCTGCTGAT CCCCCTGTTT GGAGTACACT ACATCATGTT CGCCTTCTTT CCGGACAATT  1260
TTAAGCCTGA AGTGAAGATG GTCTTTGAGC TCGTCGTGGG GTCTTTCCAG GGTTTTGTGG  1320
TGGCTATCCT CTACTGCTTC CTCAATGGTG AGGTGCAGGC GGAGCTGAGG CGGAAGTGGC  1380
GGCGCTGGCA CCTGCAGGGC GTCCTGGGCT GGAACCCCAA ATACCGGCAC CCGTCGGGAG  1440
GCAGCAACGG CGCCACGTGC AGCACGCAGG TTTCCATGCT GACCCGCGTC AGCCCAGGTG  1500
CCCGCCGCTC CTCCAGCTTC CAAGCCGAAG TCTCCCTGGT CTGACCACCA GGATCCCAGC  1560
CCAAGCGGCC CCTCCCGCCC CTTCCCACTC GCAGCAGACG CCGGGGACAG AGGCCTGCCC  1620
GGGCGCGCCA GCCCCGGCCC TGGGCTCGGA GGCTGCCCCC GGCCCCCTGG TCTCTGGTCC  1680
GGACACTCCT AGAGAACGCA GCCCTAGAGC CTGCCTGGAG CGTTTCTAGC AAGTGAGAGA  1740
GATGGGAGCT CCTCTCCTGG AGGATGCAGG TGGAACTCAG TCATTAGACT CCTCCTCCAA  1800
AGGCCCCCTA CGCCAATCAA GGGCAAAAAG TCTACATACT TTCATCCTGA CTCTGCCCCC  1860
TGCTGGCTCT TCTGCCCAAT TGGAGGAAAG CAACCGGTGG ATCCTCAAAC AACACTGGTG  1920
TGACCTGAGG GCAGAAAGGT TCTGCCCGGG AAGGTCACCA GCACCAACAC CACGGTAGTG  1980
CCTGAAATTT CACCATTGCT GTCAAGTTCC TTTGGGTTAA GCATTACCAC TCAGGCATTT  2040
GACTGAAGAT GCAGCTCACT ACCCTATTCT CTCTTTACGC TTAGTTATCA GCTTTTTAAA  2100
GTGGGTTATT CTGGAGTTTT TGTTTGGAGA GCACACCTAT CTTAGTGGTT CCCCACCGAA  2160
GTGGACTGGC CCCTGGGTCA GTCTGGTGGG AGGACGGTGC AACCCAAGGA CTGAGGGACT  2220
CTGAAGCCTC TGGGAAATGA GAAGGCAGCC ACCAGCGAAT GCTAGGTCTC GGACTAAGCC  2280
TACCTGCTCT CCAAGTCTCA GTGGCTTCAT CTGTCAAGTG GGACTCTGTC ACACCAGCCA  2340
TTCTTATCTC TCTGTGCTGT GGAAGCAACA GGAATCAAGA GACTGCCCTC CTTGTCCACC  2400
CACCTATGTG CCAACTGTTG TAACTAGGCT CAGAGATGTG CACCCATGGG CTCTGACAGA  2460
AAGCAGATCC TCACCCTGCT ACACATACAG GATTTGAACT CAGATCTGTC TGATAGGAAT  2520
GTGAAAGCAC GGACTCTTAC TGCTAACTTT TGTGTATCGT AACCAGCCAG ATCCTCTTGG  2580
TTATTTGTTT ACCACTTGTA TTATTAATGC CATTATCCCT GAATTCCCCT TGCCACCCCA  2640
CCCTCCCTGG AGTGTGGCTG AGGAGGCCTC CATCTCATGT ATCATCTGGA TAGGAGCCTG  2700
CTGGTCACAG CCTCCTCTGT CTGCCCTTCA CCCCAGTGGC CACTCAGCTT CCTACCCACA  2760
CCTCTGCCAG AAGATCCCCT CAGGACTGCA ACAGGCTTGT GCAACAATAA ATGTTGGCTT  2820
GGAAAAAAAA AAAA
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SEQ ID NO:177 PM72 Protein sequence:

Protein Accession #: JC2195

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MPPPPLLSLR RLGGGWSAVT RLVVAAAGAR SRGGRGGSRG AGGGGRGGVA RRRRLELRAA   60
RSLLGSSLQE ECDYVQMIEV QHKQCLEEAQ LENETIGCSK MWDNLTCWPA TPRGQVVVLA  120
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CPLIFKLFSS IQGRNVSRSC TDEGWTHLEP GPYPIACGLD DKAASLDEQQ TMFYGSVKTG   180
YTIGYGLSLA TLLVATAILS LPRKLHCTRN YIHMHLFISF ILRAAAVFIK DLALFDSGES   240
DQCSEGSVGC KAAMVFFQYC VMANFFWLLV EGLYLYTLLA VSFFSERKYF WGYILIGWGV   300
PSTFTMVWTI ARIHFEDYGL LRCWDTINSS LWWIIKGPIL TSILVNFILF ICIIRILLQK   360
LRPPDIRKSD SSPYSRLARS TLLLIPLFGV HYIMFAFFPD NFKPEVKMVF ELVVGSFQGF   420
VVAILYCFLN GEVQAELRRK WRRWHLQGVL GWNPKYRHPS GGSNGATCST QVSMLTRVSP   480
GARRSSSFQA EVSLV
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SEQ ID NO:178 BFF8 DNA SEQUENCE

Nucleic Acid Accession #: AL133619

Coding sequence: 1-2070 (underlined sequences correspond to start and stop codons)

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ATGAGCGGTG CGGGGGTGGC GGCTGGGACG CGGCCCCCCA GCTCGCCGAC CCCGGGCTCT     60
CGGCGCCGGC GCCAGCGCCC CTCTGTGGGC GTCCAGTCCT TGAGGCCGCA GAGCCCGCAG    120
CTCAGGCAGA GCGACCCGCA GAAACGGAAC CTGGACCTGG AGAAAAGCCT GCAGTTCCTG    180
CAGCAGCAGC ACTCGGAGAT GCTGGCCAAG CTCCATGAGG AGATCGAGCA TCTGAAGCGG    240
GAAAACAAGG GTGAGCCGGC GCGGGGCCCT AGGCCGGCCC TGCCTCCCCA GGCACACTCA    300
ACACTGCCGC TCCCGCAGCA CAGAAACACA GCCATCAACT CCAGCACACG CCTGGGCTCA    360
GGGGGAACAC AGGACGGGGA GCCCCTCCAG ACTGTCCTTG CCCACCTGGC TGCACTGGCC    420
CCTGTATGCC AACCCAGTGG GTACAGGTTC TGGGGGACCT GGACAGATGC CGCTACCTCT    480
AGCCGTGGCT GGACGATGTT ATGCAGCCAA GCACAGCACG TGCTGCTCTC GGGAAGCCCA    540
GGGCCTGAGG TCATTGCAGG GCGGCAGGTG GCCACAGGGT GCTCCCCAGA CCTCCCTCCT    600
CCAAGTAGAG CTGAAATGGG AAGGAACCCC TGGGACAGCC CCTGCCCTGC TAGATCTTTG    660
CCTCAGATTG CTGCTGTGGC CAGGCCCAGG ATTTCCAGCC CTATGGCTCT GAGTCCTCAC    720
ATGCTGGGGG CCCAGGGGAT ATGGACACAC TCCATCCAGG GATCCCTTCC TGCCATCTGG    780
GCAGCAACCA TGGGGACAAA GGGAGGAAGC AGAGTCCTGT TTCCTTGCCA CTTGTCCAAG    840
GCACTTCCCC ATCCTGACAG CGGCCCCCAC CCAGCCCAGG ATCCTGGGCT GTGGTCTCAA    900
GCTCACTTCC CATTATCTTT GGGGCTGGGG CTGACATCAG GAGGACATCT GACTGGTGGA    960
TGGAGCCAGC CTGGGAACAT CGCAGCTGGG GCAGTGCCTA GGGCTCTCCC TTCCCAGGGA   1020
GACATGGAGA AGGGGGTTGA GGGAGGGCCC TTCCCTAGCC GCTGTGGCAA CTCCAGTGAG   1080
CTGTTCTGGG CAAAGTGTGG CCCAAGTCGG CAGCCCCAGC CCTGCAGTGC TGGGGACGCT   1140
GACAGGACAC GGGAAGAGGC CATGCTTTCC CTCGGGACCT GCTGTTCCAT GTGTCCCAAG   1200
CCCTCCTGCT TTCCAGATGG CCCCTCAGGA AACCACCTTT CCAGGGCCTC TGCTCCCTTG   1260
GGCGCTCGCT GGGTCTGCAT CAACGGAGTG TGGGTAGAGC CGGGAGGACC CAGCCCTGCC   1320
AGGCTGAAGG AGGGCTCCTC ACGGACACAC AGGCCAGGAG GCAAGCGTGG GCGTCTTGCG   1380
GGCGGTAGCG CCGACACTGT GCGCTCTCCT GCAGACAGCC TCTCCATGTC AAGCTTCCAG   1440
TCTGTCAAGT CCATCTCTAA TTCAGCCAAC TCTCAAGGCA AGGCCAGGCC CCAGCCCGGC   1500
TCCTTCAACA AGCAAGATTC AAAAGCTGAC GTCTCCCAGA AGGCGGACCT GGAAGAGGAG   1560
CCCCTACTTC ACAACAGCAA GCTGGACAAA GTTCCTGGGG TACAAGGGCA GGCCAGAAAG   1620
GAGAAAGCAG AGGCCTCTAA TGCAGGAGCT GCCTGTATGG GGAACAGCCA GCACCAGGGC   1680
AGGCAGATGG GGGCGGGGGC ACACCCCCCA ATGATCCTGC CCCTTCCCCT GCGAAAGCCC   1740
ACCACACTTA GGCAGTGCGA AGTGCTCATC CGCGAGCTGT GGAATACCAA CCTCCTGCAG   1800
ACCCAAGAGC TGCGGCACCT CAAGTCCCTC CTGGAAGGGA GCCAGAGGCC CCAGGCAGCC   1860
CCGGAGGAAG CTAGCTTTCC CAGGGACCAA GAAGCCACGC ATTTCCCCAA GGTCTCCACC   1920
AAGAGCCTCT CCAAGAAATG CCTGAGCCCA CCTGTGGCGG AGCGTGCCAT CCTGCCCGCA   1980
CTGAAGCAGA CCCCGAAGAA CAACTTTGCC GAGAGGCAGA AGAGGCTGCA GGCAATGCAG   2040
AAACGGCGCC TGCATCGCTC AGTGCTTTGA
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SEQ ID NO:179 BFF8 Protein sequence:

Protein Accession #: T43457

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1          11         21         31         41         51
|          |          |          |          |          |
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QQQHSEMLAK LHEEIEHLKR ENKGEPARGP RPALPPQAHS TLPLPQHRNT AINSSTRLGS    120
GGTQDGEPLQ TVLAHLAALA PVCQPSGYRF WGTWTDAATS SRGWTMLCSQ AQHVLLSGSP    180
GPEVIAGRQV ATGCSPDLPP PSRAEMGRNP WDSPCPARSL PQIAAVARPR ISSPMALSPH    240
MLGAQGIWTH SIQGSLPAIW AATMGTKGGS RVLFPCHLSK ALPHPDSGPH PAQDPGLWSQ    300
AHFPLSLGLG LTSGGHLTGG WSQPGNIAAG AVPRALPSQG DMEKGVEGGP FPSRCGNSSE    360
LFWAKCGPSR QPQPCSAGDA DRTREEAMLS LGTCCSMCPK PSCFPDGPSG NHLSRASAPL    420
GARWVCINGV WVEPGGPSPA RLKEGSSRTH RPGGKRGRLA GGSADTVRSP ADSLSMSSFQ    480
SVKSISNSAN SQGKARPQPG SFNKQDSKAD VSQKADLEEE PLLHNSKLDK VPGVQGQARK    540
EKAEASNAGA ACMGNSQHQG RQMGAGAHPP MILPLPLRKP TTLRQCEVLI RELWNTNLLQ    600
TQELRHLKSL LEGSQRPQAA PEEASFPRDQ EATHFPKVST KSLSKKCLSP PVAERAILPA    660
LKQTPKNNFA ERQKRLQAMQ KRRLHRSVL
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SEQ ID NO:180 BCR4 DNA SEQUENCE

Nucleic Acid Accession #: NM_012319.2

Coding sequence: 138-2405 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
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CTCGTGCCGA ATTCGGCACG AGACCGCGTG TTCGCGCCTG GTAGAGATTT CTCGAAGACA     60
CCAGTGGGCC CGTGTGGAAC CAAACCTGCG CGCGTGGCCG GGCCGTGGGA CAACGAGGCC    120
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GCGGAGACGA AGGCGCAATG GCGAGGAAGT TATCTGTAAT CTTGATCCTG ACCTTTGCCC   180
TCTCTGTCAC AAATCCCCTT CATGAACTAA AAGCAGCTGC TTTCCCCCAG ACCACTGAGA   240
AAATTAGTCC GAATTGGGAA TCTGGCATTA ATGTTGACTT GGCAATTTCC ACACGGCAAT   300
ATCATCTACA ACAGCTTTTC TACCGCTATG GAGAAAATAA TTCTTTGTCA GTTGAAGGGT   360
TCAGAAAATT ACTTCAAAAT ATAGGCATAG ATAAGATTAA AAGAATCCAT ATACACCATG   420
ACCACGACCA TCACTCAGAC CACGAGCATC ACTCAGACCA TGAGCGTCAC TCAGACCATG   480
AGCATCACTC AGACCACGAG CATCACTCTG ACCATGATCA TCACTCTCAC CATAATCATG   540
CTGCTTCTGG TAAAAATAAG CGAAAAGCTC TTTGCCCAGA CCATGACTCA GATAGTTCAG   600
GTAAAGATCC TAGAAACAGC CAGGGGAAAG GAGCTCACCG ACCAGAACAT GCCAGTGGTA   660
GAAGGAATGT CAAGGACAGT GTTAGTGCTA GTGAAGTGAC CTCAACTGTG TACAACACTG   720
TCTCTGAAGG AACTCACTTT CTAGAGACAA TAGAGACTCC AAGACCTGGA AAACTCTTCC   780
CCAAAGATGT AAGCAGCTCC ACTCCACCCA GTGTCACATC AAAGAGCCGG GTGAGCCGGC   840
TGGCTGGTAG GAAAACAAAT GAATCTGTGA GTGAGCCCCG AAAAGGCTTT ATGTATTCCA   900
GAAACACAAA TGAAAATCCT CAGGAGTGTT TCAATGCATC AAAGCTACTG ACATCTCATG   960
GCATGGGCAT CCAGGTTCCG CTGAATGCAA CAGAGTTCAA CTATCTCTGT CCAGCCATCA  1020
TCAACCAAAT TGATGCTAGA TCTTGTCTGA TTCATACAAG TGAAAAGAAG GCTGAAATCC  1080
CTCCAAAGAC CTATTCATTA CAAATAGCCT GGGTTGGTGG TTTTATAGCC ATTTCCATCA  1140
TCAGTTTCCT GTCTCTGCTG GGGGTTATCT TAGTGCCTCT CATGAATCGG GTGTTTTTCA  1200
AATTTCTCCT GAGTTTCCTT GTGGCACTGG CCGTTGGGAC TTTGAGTGGT GATGCTTTTT  1260
TACACCTTCT TCCACATTCT CATGCAAGTC ACCACCATAG TCATAGCCAT GAAGAACCAG  1320
CAATGGAAAT GAAAAGAGGA CCACTTTTCA GTCATCTGTC TTCTCAAAAC ATAGAAGAAA  1380
GTGCCTATTT TGATTCCACG TGGAAGGGTC TAACAGCTCT AGGAGGCCTG TATTTCATGT  1440
TTCTTGTTGA ACATGTCCTC ACATTGATCA AACAATTTAA AGATAAGAAG AAAAAGAATC  1500
AGAAGAAACC TGAAAATGAT GATGATGTGG AGATTAAGAA GCAGTTGTCC AAGTATGAAT  1560
CTCAACTTTC AACAAATGAG GAGAAAGTAG ATACAGATGA TCGAACTGAA GGCTATTTAC  1620
GAGCAGACTC ACAAGAGCCC TCCCACTTTG ATTCTCAGCA GCCTGCAGTC TTGGAAGAAG  1680
AAGAGGTCAT GATAGCTCAT GCTCATCCAC AGGAAGTCTA CAATGAATAT GTACCCAGAG  1740
GGTGCAAGAA TAAATGCCAT TCACATTTCC ACGATACACT CGGCCAGTCA GACGATCTCA  1800
TTCACCACCA TCATGACTAC CATCATATTC TCCATCATCA CCACCACCAA AACCACCATC  1860
CTCACAGTCA CAGCCAGCGC TACTCTCGGG AGGAGCTGAA AGATGCCGGC GTCGCCACTT  1920
TGGCCTGGAT GGTGATAATG GGTGATGGCC TGCACAATTT CAGCGATGGC CTAGCAATTG  1980
GTGCTGCTTT TACTGAAGGC TTATCAAGTG GTTTAAGTAC TTCTGTTGCT GTGTTCTGTC  2040
ATGAGTTGCC TCATGAATTA GGTGACTTTG CTGTTCTACT AAAGGCTGGC ATGACCGTTA  2100
AGCAGGCTGT CCTTTATAAT GCATTGTCAG CCATGCTGGC GTATCTTGGA ATGGCAACAG  2160
GAATTTTCAT TGGTCATTAT GCTGAAAATG TTTCTATGTG GATATTTGCA CTTACTGCTG  2220
GCTTATTCAT GTATGTTGCT CTGGTTGATA TGGTACCTGA AATGCTGCAC AATGATGCTA  2280
GTGACCATGG ATGTAGCCGC TGGGGGTATT TCTTTTTACA GAATGCTGGG ATGCTTTTGG  2340
GTTTTGGAAT TATGTTACTT ATTTCCATAT TTGAACATAA AATCGTGTTT CGTATAAATT  2400
TCTAGTTAAG GTTTAAATGC TAGAGTAGCT TAAAAAGTTG TCATAGTTTC AGTAGGTCAT  2460
AGGGAGATGA GTTTGTATGC TGTACTATGC AGCGTTTAAA GTTAGTGGGT TTTGTGATTT  2520
TTGTATTGAA TATTGCTGTC TGTTACAAAG TCAGTTAAAG GTACGTTTTA ATATTTAAGT  2580
TATTCTATCT TGGAGATAAA ATCTGTATGT GCAATTCACC GGTATTACCA GTTTATTATG  2640
TAAACAAGAG ATTTGGCATG ACATGTTCTG TATGTTTCAG GGAAAAATGT CTTTAATGCT  2700
TTTTCAAGAA CTAACACAGT TATTCCTATA CTGGATTTTA GGTCTCTGAA GAACTGCTGG  2760
TGTTTAGGAA TAAGAATGTG CATGAAGCCT AAAATACCAA GAAAGCTTAT ACTGAATTTA  2820
AGCAAAGAAA TAAAGGAGAA AAGAGAAGAA TCTGAGAATT GGGGAGGCAT AGATTCTTAT  2880
AAAAATCACA AAATTTGTTG TAAATTAGAG GGGAGAAATT TAGAATTAAG TATAAAAAGG  2940
CAGAATTAGT ATAGAGTACA TTCATTAAAC ATTTTTGTCA GGATTATTTC CCGTAAAAAC  3000
GTAGTGAGCA CTCTCATATA CTAATTAGTG TACATTTAAC TTTGTATAAT ACAGAAATCT  3060
AAATATATTT AATGAATTCA AGCAATATAC ACTTGACCAA GAAATTGGAA TTTCAAAATG  3120
TTCGTGCGGG TTATATACCA GATGAGTACA GTGAGTAGTT TATGTATCAC CAGACTGGGT  3180
TATTGCCAAG TTATATATCA CCAAAAGCTG TATGACTGGA TGTTCTGGTT ACCTGGTTTA  3240
CAAAATTATC AGAGTAGTAA AACTTTGATA TATATGAGGA TATTAAAACT ACACTAAGTA  3300
TCATTTGATT CGATTCAGAA AGTACTTTGA TATCTCTCAG TGCTTCAGTG CTATCATTGT  3360
GAGCAATTGT CTTTATATAC GGTACTGTAG CCATACTAGG CCTGTCTGTG GCATTCTCTA  3420
GATGTTTCTT TTTTACACAA TAAATTCCTT ATATCAGCTT G
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SEQ ID NO:181 BCR4 PROTEIN SEQUENCE

Protein Accession #: NP_036451

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1          11         21         31         41         51
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FYRYGENNSL SVEGFRKLLQ NIGIDKIKRI HIHHDHDHHS DHEHHSDHER HSDHEHHSDH   120
EHHSDHDHHS HHNHAASGKN KRKALCPDHD SDSSGKDPRN SQGKGAHRPE HASGRRNVKD   180
SVSASEVTST VYNTVSEGTH FLETIETPRP GKLFPKDVSS STPPSVTSKS RVSRLAGRKT   240
NESVSEPRKG FMYSRNTNEN PQECFNASKL LTSHGMGIQV PLNATEFNYL CPAIINQIDA   300
RSCLIHTSEK KAEIPPKTYS LQIAWVGGFI AISIISFLSL LGVILVPLMN RVFFKFLLSF   360
LVALAVGTLS GDAFLHLLPH SHASHHHSHS HEEPAMEMKR GPLFSHLSSQ NIEESAYFDS   420
TWKGLTALGG LYFMFLVEHV LTLIKQFKDK KKKNQKKPEN DDDVEIKKQL SKYESQLSTN   480
EEKVDTDDRT EGYLRADSQE PSHFDSQQPA VLEEEEVMIA HAHPQEVYNE YVPRGCKNKC   540
HSHFHDTLGQ SDDLIHHHHD YHHILHHHHH QNHHPHSHSQ RYSREELKDA GVATLAWMVI   600
MGDGLHNFSD GLAIGAAFTE GLSSGLSTSV AVFCHELPHE LGDFAVLLKA GMTVKQAVLY   660
NALSAMLAYL GMATGIFIGH YAENVSMWIF ALTAGLFMYV ALVDMVPEML HNDASDHGCS   720
RWGYFFLQNA GMLLGFGIML LISIFEHKIV FRINF
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SEQ ID NO:182 BCY2 DNA sequence
Nucleic Acid Accession #: NM_001203
Coding sequence: 274-1782 (underlined sequences correspond to start and stop codons)

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GAGGACGCGG GAGCCGGGAG CGCACGCGCG GGGTGGAGTT CAGCCTACTC TTTCTTAGAT  120
GTGAAAGGAA AGGAAGATCA TTTCATGCCT TGTTGATAAA GGTTCAGACT TCTGCTGATT  180
CATAACCATT TGGCTCTGAG CTATGACAAG AGAGGAAACA AAAAGTTAAA CTTACAAGCC  240
TGCCATAAGT GAGAAGCAAA CTTCCTTGAT AACATGCTTT TGCGAAGTGC AGGAAAATTA  300
AATGTGGGCA CCAAGAAAGA GGATGGTGAG AGTACAGCCC CCACCCCCCG TCCAAAGGTC  360
TTGCGTTGTA AATGCCACCA CCATTGTCCA GAAGACTCAG TCAACAATAT TTGCAGCACA  420
GACGGATATT GTTTCACGAT GATAGAAGAG GATGACTCTG GGTTGCCTGT GGTCACTTCT  480
GGTTGCCTAG GACTAGAAGG CTCAGATTTT CAGTGTCGGG ACACTCCCAT TCCTCATCAA  540
AGAAGATCAA TTGAATGCTG CACAGAAAGG AACGAATGTA ATAAAGACCT ACACCCTACA  600
CTGCCTCCAT TGAAAAACAG AGATTTTGTT GATGGACCTA TACACCACAG GGCTTTACTT  660
ATATCTGTGA CTGTCTGTAG TTTGCTCTTG GTCCTTATCA TATTATTTTG TTACTTCCGG  720
TATAAAAGAC AAGAAACCAG ACCTCGATAC AGCATTGGGT TAGAACAGGA TGAAACTTAC  780
ATTCCTCCTG GAGAATCCCT GAGAGACTTA ATTGAGCAGT CTCAGAGCTC AGGAAGTGGA  840
TCAGGCCTCC CTCTGCTGGT CCAAAGGACT ATAGCTAAGC AGATTCAGAT GGTGAAACAG  900
ATTGGAAAAG GTCGCTATGG GGAAGTTTGG ATGGGAAAGT GGCGTGGCGA AAAGGTAGCT  960
GTGAAAGTGT TCTTCACCAC AGAGGAAGCC AGCTGGTTCA GAGAGACAGA AATATATCAG 1020
ACAGTGTTGA TGAGGCATGA AAACATTTTG GGTTTCATTG CTGCAGATAT CAAAGGGACA 1080
GGGTCCTGGA CCCAGTTGTA CCTAATCACA GACTATCATG AAAATGGTTC CCTTTATGAT 1140
TATCTGAAGT CCACCACCCT AGACGCTAAA TCAATGCTGA AGTTAGCCTA CTCTTCTGTC 1200
AGTGGCTTAT GTCATTTACA CACAGAAATC TTTAGTACTC AAGGCAAACC AGCAATTGCC 1260
CATCGAGATC TGAAAAGTAA AAACATTCTG GTGAAGAAAA ATGGAACTTG CTGTATTGCT 1320
GACCTGGGCC TGGCTGTTAA ATTTATTAGT GATACAAATG AAGTTGACAT ACCACCTAAC 1380
ACTCGAGTTG GCACCAAACG CTATATGCCT CCAGAAGTGT TGGACGAGAG CTTGAACAGA 1440
AATCACTTCC AGTCTTACAT CATGGCTGAC ATGTATAGTT TTGGCCTCAT CCTTTGGGAG 1500
GTTGCTAGGA GATGTGTATC AGGAGGTATA GTGGAAGAAT ACCAGCTTCC TTATCATGAC 1560
CTAGTGCCCA GTGACCCCTC TTATGAGGAC ATGAGGGAGA TTGTGTGCAT CAAGAAGTTA 1620
CGCCCCTCAT TCCCAAACCG GTGGAGCAGT GATGAGTGTC TAAGGCAGAT GGGAAAACTC 1680
ATGACAGAAT GCTGGGCTCA CAATCCTGCA TCAAGGCTGA CAGCCCTGCG GGTTAAGAAA 1740
ACACTTGCCA AAATGTCAGA GTCCCAGGAC ATTAAACTCT GATAGGAGAG GAAAAGTAAG 1800
CATCTCTGCA GAAAGCCAAC AGGTACTCTT CTGTTTGTGG GCAGAGCAAA AGACATCAAA 1860
TAAGCATCCA CAGTACAAGC CTTGAACATC GTCCTGCTTC CCAGTGGGTT CAGACCTCAC 1920
CTTTCAGGGA GCGACCTGGG CAAAGACAGA GAAGCTCCCA GAAGGAGAGA TTGATCCGTG 1980
TCTGTTTGTA GGCGGAGAAA CCGTTGGGTA ACTTGTTCAA GATATGATGC AT
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SEQ ID NO:183 BCY2 Protein sequence
Protein Accession #: NP_001194

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GPIHHRALLI SVTVCSLLLV LIILFCYFRY KRQETRPRYS IGLEQDETYI PPGESLRDLI  180
EQSQSSGSGS GLPLLVQRTI AKQIQMVKQI GKGRYGEVWM GKWRGEKVAV KVFFTTEEAS  240
WFRETEIYQT VLMRHENILG FIAADIKGTG SWTQLYLITD YHENGSLYDY LKSTTLDAKS  300
MLKLAYSSVS GLCHLHTEIF STQGKPAIAH RDLKSKNILV KKNGTCCIAD LGLAVKFISD  360
TNEVDIPPNT RVGTKRYMPP EVLDESLNRN HFQSYIMADM YSFGLILWEV ARRCVSGGIV  420
EEYQLPYHDL VPSDPSYEDM REIVCIKKLR PSFPNRWSSD ECLRQMGKLM TECWAHNPAS  480
RLTALRVKKT LAKMSESQDI KL
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SEQ ID NO:184 CBF9 DNA sequence
Nucleic Acid Accession #: AC005383
Coding Sequence: 328-2751 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
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GACAGTGTTC GCGGCTGCAC CGCTCGGAGG CTGGGTGACC CGCGTAGAAG TGAAGTACTT   60
TTTTATTTGC AGACCTGGGC CGATGCCGCT TTAAAAAACG CGAGGGGCTC TATGCACCTC  120
CCTGGCGGTA GTTCCTCCGA CCTCAGCCGG GTCGGGTCGT GCCGCCCTCT CCCAGGAGAG  180
ACAAACAGGT GTCCCACGTG GCAGCCGCGC CCCGGGCGCC CCTCCTGTGA TCCCGTAGCG  240
CCCCCTGGCC CGAGCCGCGC CCGGGTCTGT GAGTAGAGCC GCCCGGGCAC CGAGCGCTGG  300
TCGCCGCTCT CCTTCCGTTA TATCAACATG CCCCCTTTCC TGTTGCTGGA GGCCGTCTGT  360
GTTTTCCTGT TTTCCAGAGT GCCCCCATCT CTCCCTCTCC AGGAAGTCCA TGTAAGCAAA  420
GAAACCATCG GGAAGATTTC AGCTGCCAGC AAAATGATGT GGTGCTCGGC TGCAGTGGAC  480
ATCATGTTTC TGTTAGATGG GTCTAACAGC GTCGGGAAAG GGAGCTTTGA AAGGTCCAAG  540
CACTTTGCCA TCACAGTCTG TGACGGTCTG GACATCAGCC CCGAGAGGGT CAGAGTGGGA  600
GCATTCCAGT TCAGTTCCAC TCCTCATCTG GAATTCCCCT TGGATTCATT TTCAACCCAA  660
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CAGGAAGTGA AGGCAAGAAT CAAGAGGATG GTTTTCAAAG GAGGGCGCAC GGAGACGGAA    720
CTTGCTCTGA AATACCTTCT GCACAGAGGG TTGCCTGGAG GCAGAAATGC TTCTGTGCCC    780
CAGATCCTCA TCATCGTCAC TGATGGGAAG TCCCAGGGGG ATGTGGCACT GCCATCCAAG    840
CAGCTGAAGG AAAGGGGTGT CACTGTGTTT GCTGTGGGGG TCAGGTTTCC CAGGTGGGAG    900
GAGCTGCATG CACTGGCCAG CGAGCCTAGA GGGCAGCACG TGCTGTTGGC TGAGCAGGTG    960
GAGGATGCCA CCAACGGCCT CTTCAGCACC CTCAGCAGCT CGGCCATCTG CTCCAGCGCC   1020
ACGCCAGACT GCAGGGTCGA GGCTCACCCC TGTGAGCACA GGACGCTGGA GATGGTCCGG   1080
GAGTTCGCTG GCAATGCCCC ATGCTGGAGA GGATCGCGGC GGACCCTTGC GGTGCTGGCT   1140
GCACACTGTC CCTTCTACAG CTGGAAGAGA GTGTTCCTAA CCCACCCTGC CACCTGCTAC   1200
AGGACCACCT GCCCAGGCCC CTGTGACTCG CAGCCCTGCC AGAATGGAGG CACATGTGTT   1260
CCAGAAGGAC TGGACGGCTA CCAGTGCCTC TGCCCGCTGG CCTTTGGAGG GGAGGCTAAC   1320
TGTGCCCTGA AGCTGAGCCT GGAATGCAGG GTCGACCTCC TCTTCCTGCT GGACAGCTCT   1380
GCGGGCACCA CTCTGGACGG CTTCCTGCGG GCCAAAGTCT TCGTGAAGCG GTTTGTGCGG   1440
GCCGTGCTGA GCGAGGACTC TCGGGCCCGA GTGGGTGTGG CCACATACAG CAGGGAGCTG   1500
CTGGTGGCGG TGCCTGTGGG GGAGTACCAG GATGTGCCTG ACCTGGTCTG GAGCCTCGAT   1560
GGCATTCCCT TCCGTGGTGG CCCCACCCTG ACGGGCAGTG CCTTGCGGCA GGCGGCAGAG   1620
CGTGGCTTCG GGAGCGCCAC CAGGACAGGC CAGGACCGGC CACGTAGAGT GGTGGTTTTG   1680
CTCACTGAGT CACACTCCGA GGATGAGGTT GCGGGCCCAG CGCGTCACGC AAGGGCGCGA   1740
GAGCTGCTCC TGCTGGGTGT AGGCAGTGAG GCCGTGCGGG CAGAGCTGGA GGAGATCACA   1800
GGCAGCCCAA AGCATGTGAT GGTCTACTCG GATCCTCAGG ATCTGTTCAA CCAAATCCCT   1860
GAGCTGCAGG GGAAGCTGTG CAGCCGGCAG CGGCCAGGGT GCCGGACACA AGCCCTGGAC   1920
CTCGTCTTCA TGTTGGACAC CTCTGCCTCA GTAGGGCCCG AGAATTTTGC TCAGATGCAG   1980
AGCTTTGTGA GAAGCTGTGC CCTCCAGTTT GAGGTGAACC CTGACGTGAC ACAGGTCGGC   2040
CTGGTGGTGT ATGGCAGCCA GGTGCAGACT GCCTTCGGGC TGGACACCAA ACCCACCCGG   2100
GCTGCGATGC TGCGGGCCAT TAGCCAGGCC CCCTACCTAG GTGGGGTGGG CTCAGCCGGC   2160
ACCGCCCTGC TGCACATCTA TGACAAAGTG ATGACCGTCC AGAGGGGTGC CCGGCCTGGT   2220
GTCCCCAAAG CTGTGGTGGT GCTCACAGGC GGGAGAGGCG CAGAGGATGC AGCCGTTCCT   2280
GCCCAGAAGC TGAGGAACAA TGGCATCTCT GTCTTGGTCG TGGGCGTGGG GCCTGTCCTA   2340
AGTGAGGGTC TGCGGAGGCT TGCAGGTCCC CGGGATTCCC TGATCCACGT GGCAGCTTAC   2400
GCCGACCTGC GGTACCACCA GGACGTGCTC ATTGAGTGGC TGTGTGGAGA AGCCAAGCAG   2460
CCAGTCAACC TCTGCAAACC CAGCCCGTGC ATGAATGAGG GCAGCTGCGT CCTGCAGAAT   2520
GGGAGCTACC GCTGCAAGTG TCGGGATGGC TGGGAGGGCC CCCACTGCGA GAACCGTGAG   2580
TGGAGCTCTT GCTCTGTATG TGTGAGCCAG GGATGGATTC TTGAGACGCC CCTGAGGCAC   2640
ATGGCTCCCG TGCAGGAGGG CAGCAGCCGT ACCCCTCCCA GCAACTACAG AGAAGGCCTG   2700
GGCACTGAAA TGGTGCCTAC CTTCTGGAAT GTCTGTGCCC CAGGTCCTTA GAATGTCTGC   2760
TTCCCGCCGT GGCCAGGACC ACTATTCTCA CTGAGGGAGG AGGATGTCCC AACTGCAGCC   2820
ATGCTGCTTA GAGACAAGAA AGCAGCTGAT GTCACCCACA AACGATGTTG TTGAAAAGTT   2880
TTGATGTGTA AGTAAATACC CACTTTCTGT ACCTGCTGTG CCTTGTTGAG GCTATGTCAT   2940
CTGCCACCTT TCCCTTGAGG ATAAACAAGG GGTCCTGAAG ACTTAAATTT AGCGGCCTGA   3000
CGTTCCTTTG CACACAATCA ATGCTCGCCA GAATGTTGTT GACACAGTAA TGCCCAGCAG   3060
AGGCCTTTAC TAGAGCATCC TTTGGACGGC GAAGGCCACG GCCTTTCAAG ATGGAAAGCA   3120
GCAGCTTTTC CACTTCCCCA GAGACATTCT GGATGCATTT GCATTGAGTC TGAAAGGGGG   3180
CTTGAGGGAC GTTTGTGACT TCTTGGCGAC TGCCTTTTGT GTGTGGAAGA GACTTGGAAA   3240
GGTCTCAGAC TGAATGTGAC CAATTAACCA GCTTGGTTGA TGATGGGGGA GGGGCTGAGT   3300
TGTGCATGGG CCCAGGTCTG GAGGGCCACG TAAAATCGTT CTGAGTCGTG AGCAGTGTCC   3360
ACCTTGAAGG TCTTC
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SEQ ID NO:185 CBF9 Protein sequence

Protein Accession #: none found

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SVGKGSFERS KHFAITVCDG LDISPERVRV GAFQPSSTPH LEFPLDSFST QQEVKARIKR    120
MVPKGGRTET ELALKYLLHR GLPGGRNASV PQILIIVTDG KSQGDVALPS KQLKERGVTV    180
FAVGVRFPRW EELHALASEP RGQHVLLAEQ VEDATNGLFS TLSSSAICSS ATPDCRVEAH    240
PCEHRTLEMV REFAGNAPCW RGSRRTLAVL AAHCPFYSWK RVFLTHPATC YRTTCPGPCD    300
SQPCQNGGTC VPEGLDGYQC LCPLAFGGEA NCALKLSLEC RVDLLFLLDS SAGTTLDGFL    360
RAKVFVKRFV RAVLSEDSRA RVGVATYSRE LLVAVPVGEY QDVPDLVWSL DGIPFRGGPT    420
LTGSALRQAA ERGFGSATRT GQDRPRRVVV LLTESHSEDE VAGPARHARA RELLLLGVGS    480
EAVRAELEEI TGSPKHVMVY SDPQDLFNQI PELQGKLCSR QRPGCRTQAL DLVFMLDTSA    540
SVGPENFAQM QSFVRSCALQ FEVNPDVTQV GLVVYGSQVQ TAFGLDTKPT RAAMLRAISQ    600
APYLGGVGSA GTALLHIYDK VMTVQRGARP GVPKAVVVLT GGRGAEDAAV PAQKLRNNGI    660
SVLVVGVGPV LSEGLRRLAG PRDSLIHVAA YADLRYHQDV LIEWLCGEAK QPVNLCKPSP    720
CMNEGSCVLQ NGSYRCKCRD GWEGPHCENR EWSSCSVCVS QGWILETPLR HMAPVQEGSS    780
RTPPSNYREG LGTEMVPTFW NVCAPGP
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SEQ ID NO:186 PAV1 DNA sequence

Nucleic Acid Accession #: AF272890

Coding Sequence: 87-1520 (underlined sequences correspond to start and stop codons)

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CCCGCCCCCG GCCTCCGCAG CTCGGCATGG GCGCGGGGGT GCTCGTCCTG GGCGCCTCCG    120
AGCCCGGTAA CCTGTCGTCG GCCGCACCGC TCCCCGACGG CGCGGCCACC GCGGCGCGGC    180
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TGCTGGTGCC CGCGTCGCCG CCCGCCTCGT TGCTGCCTCC CGCCAGCGAA AGCCCCGAGC   240
CGCTGTCTCA GCAGTGGACA GCGGGCATGG GTCTGCTGAT GGCGCTCATC GTGCTGCTCA   300
TCGTGGCGGG CAATGTGCTG GTGATCGTGG CCATCGCCAA GACGCCGCGG CTGCAGACGC   360
TCACCAACCT CTTCATCATG TCCCTGGCCA GCGCCGACCT GGTCATGGGG CTGCTGGTGG   420
TGCCGTTCGG GGCCACCATC GTGGTGTGGG GCCGCTGGGA GTACGGCTCC TTCTTCTGCG   480
AGCTGTGGAC CTCAGTGGAC GTGCTGTGCG TGACGGCCAG CATCGAGACC CTGTGTGTCA   540
TTGCCCTGGA CCGCTACCTC GCCATCACCT CGCCCTTCCG CTACCAGAGC CTGCTGACGC   600
GCGCGCGGGC GCGGGGCCTC GTGTGCACCG TGTGGGCCAT CTCGGCCCTG GTGTCCTTCC   660
TGCCCATCCT CATGCACTGG TGGCGGGCGG AGAGCGACGA GGCGCGCCGC TGCTACAACG   720
ACCCCAAGTG CTGCGACTTC GTCACCAACC GGGCCTACGC CATCGCCTCG TCCGTAGTCT   780
CCTTCTACGT GCCCCTGTGC ATCATGGCCT TCGTGTACCT GCGGGTGTTC CGCGAGGCCC   840
AGAAGCAGGT GAAGAAGATC GACAGCTGCG AGCGCCGTTT CCTCGGCGGC CCAGCGCGGC   900
CGCCCTCGCC CTCGCCCTCG CCCGTCCCCG CGCCCGCGCC GCCGCCCGGA CCCCCGCGCC   960
CCGCCGCCGC CGCCGCCACC GCCCCGCTGG CCAACGGGCG TGCGGGTAAG CGGCGGCCCT  1020
CGCGCCTCGT GGCCCTACGC GAGCAGAAGG CGCTCAAGAC GCTGGGCATC ATCATGGGCG  1080
TCTTCACGCT CTGCTGGCTG CCCTTCTTCC TGGCCAACGT GGTGAAGGCC TTCCACCGCG  1140
AGCTGGTGCC CGACCGCCTC TTCGTCTTCT TCAACTGGCT GGGCTACGCC AACTCGGCCT  1200
TCAACCCCAT CATCTACTGC CGCAGCCCCG ACTTCCGCAA GGCCTTCCAG GGACTGCTCT  1260
GCTGCGCGCG CAGGGCTGCC CGCCGGCGCC ACGCGACCCA CGGAGACCGG CCGCGCGCCT  1320
CGGGCTGTCT GGCCCGGCCC GGACCCCCGC CATCGCCCGG GGCCGCCTCG GACGACGACG  1380
ACGACGATGT CGTCGGGGCC ACGCCGCCCG CGCGCCTGCT GGAGCCCTGG GCCGGCTGCA  1440
ACGGCGGGGC GGCGGCGGAC AGCGACTCGA GCCTGGACGA GCCGTGCCGC CCCGGCTTCG  1500
CCTCGGAATC CAAGGTGTAG GGCCCGGCGC GGGGCGCGGA CTCCGGGCAC GGCTTCCCAG  1560
GGGAACGAGG AGATCTGTGT TTACTTAAGA CCGATAGCAG GTGAACTCGA AGCCCACAAT  1620
CCTCGTCTGA ATCATCCGAG GCAAAGAGAA AAGCCACGGA CCGTTGCACA AAAAGGAAAG  1680
TTTGGGAAGG GATGGGAGAG TGGCTTGCTG ATGTTCCTTG TTG
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SEQ ID NO:187 PAV1 Protein sequence

Protein Accession #: AA011176

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|          |          |          |          |          |
MGAGVLVLGA SEPGNLSSAA PLPDGAATAA RLLVPASPPA SLLPPASESP EPLSQQWTAG    60
MGLLMALIVL LIVAGNVLVI VAIAKTPRLQ TLTNLFIMSL ASADLVMGLL VVPFGATIVV   120
WGRWEYGSFF CELWTSVDVL CVTASIETLC VIALDRYLAI TSPFRYQSLL TRARARGLVC   180
TVWAISALVS FLPILMHWWR AESDEARRCY NDPKCCDFVT NRAYAIASSV VSFYVPLCIM   240
AFVYLRVFRE AQKQVKKIDS CERRFLGGPA RPPSPSPSPV PAPAPPPGPP RPAAAAATAP   300
LANGRAGKRR PSRLVALREQ KALKTLGIIM GVFTLCWLPF FLANVVKAFH RELVPDRLFV   360
FFNWLGYANS AFNPIIYCRS PDFRKAFQGL LCCARRAARR RHATHGDRPR ASGCLARPGP   420
PPSPGAASDD DDDDVVGATP PARLLEPWAG CNGGAAADSD SSLDEPCRPG FASESKV
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SEQ ID NO:188 BCO2 DNA sequence

Nucleic Acid Accession #: AJ400877

Coding sequence: 81-3080 (underlined sequences correspond to start and stop codons)

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|         |         |         |         |         |
GGCGTCCGCG CACACCTCCC CGCGCCGCCG CCGCCACCGC CCGCACTCCG CCGCCTCTGC   60
CCGCAACCGC TGAGCCATCC ATGGGGGTCG CGGGCCGCAA CCGTCCCGGG GCGGCCTGGG  120
CGGTGCTGCT GCTGCTGCTG CTGCTGCCGC CACTGCTGCT GCTGGCGGGG GCCGTCCCGC  180
CGGGTCGGGG CCGTGCCGCG GGGCCGCAGG AGGATGTAGA TGAGTGTGCC CAAGGGCTAG  240
ATGACTGCCA TGCCGACGCC CTGTGTCAGA ACACACCCAC CTCCTACAAG TGCTCCTGCA  300
AGCCTGGCTA CCAAGGGGAA GGCAGGCAGT GTGAGGACAT CGATGAATGT GGAAATGAGC  360
TCAATGGAGG CTGTGTCCAT GACTGTTTGA ATATTCCAGG CAATTATCGT TGCACTTGTT  420
TTGATGGCTT CATGTTGGCT CATGACGGTC ATAATTGTCT TGATGTGGAC GAGTGCCTGG  480
AGAACAATGG CGGCTGCCAG CATACCTGTG TCAACGTCAT GGGGAGCTAT GAGTGCTGCT  540
GCAAGGAGGG GTTTTTCCTG AGTGACAATC AGCACACCTG CATTCACCGC TCGGAAGAGG  600
GCCTGAGCTG CATGAATAAG GATCACGGCT GTAGTCACAT CTGCAAGGAG GCCCCAAGGG  660
GCAGCGTCGC CTGTGAGTGC AGGCCTGGTT TTGAGCTGGC CAAGAACCAG AGAGACTGCA  720
TCTTGACCTG TAACCATGGG AACGGTGGGT GCCAGCACTC CTGTGACGAT ACAGCCGATG  780
GCCCAGAGTG CAGCTGCCAT CCACAGTACA AGATGCACAC AGATGGGAGG AGCTGCCTTG  840
AGCGAGAGGA CACTGTCCTG GAGGTGACAG AGAGCAACAC CACATCAGTG GTGGATGGGG  900
ATAAACGGGT GAAACGGCGG CTGCTCATGG AAACGTGTGC TGTCAACAAT GGAGGCTGTG  960
ACCGCACCTG TAAGGATACT TCGACAGGTG TCCACTGCAG TTGTCCTGTT GGATTCACTC 1020
TCCAGTTGGA TGGGAAGACA TGTAAAGATA TTGATGAGTG CCAGACCCGC AATGGAGGTT 1080
GTGATCATTT CTGCAAAAAC ATCGTGGGCA GTTTTGACTG CGGCTGCAAG AAAGGATTTA 1140
AATTATTAAC AGATGAGAAG TCTTGCCAAG ATGTGGATGA GTGCTCTTTG GATAGGACCT 1200
GTGACCACAG CTGCATCAAC CACCCTGGCA CATTTGCTTG TGCTTGCAAC CGAGGGTACA 1260
CCCTGTATGG CTTCACCCAC TGTGGAGACA CCAATGAGTG CAGCATCAAC AACGGAGGCT 1320
GTCAGCAGGT CTGTGTGAAC ACAGTGGGCA GCTATGAATG CCAGTGCCAC CCTGGGTACA 1380
AGCTCCACTG GAATAAAAAA GACTGTGTGG AAGTGAAGGG GCTCCTGCCC ACAAGTGTGT 1440
CACCCCGTGT GTCCCTGCAC TGCGGTAAGA GTGGTGGAGG AGACGGGTGC TTCCTCAGAT 1500
GTCACTCTGG CATTCACCTC TCTTCAGATG TCACCACCAT CAGGACAAGT GTAACCTTTA 1560
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CAGCACTACC AGAGAAGCAC AGCTCAGTAA AAGAGAGCTT CCGCTACGTA AACCTTACAT 1680
GCAGCTCTGG CAAGCAAGTC CCAGGAGCCC CTGGCCGACC AAGCACCCCT AAGGAAATGT 1740
TTATCACTGT TGAGTTTGAG CTTGAAACTA ACCAAAAGGA GGTGACAGCT TCTTGTGACC 1800
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ACTTTGATGG CTCCACAAAC ATAACCCAGT GTAAAAACAG AAGATGTGGA GGGGAGCTGG 2520
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AGTGTACGTG GACCATCAAC CCACCCCCCA AGCGCCGCAT CCTGATCGTG GTCCCTGAGA 2640
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TCCAGGTCCC ATACGTGACA TATGATGAGG ACTACCAGGA ACTCATTGAA GACATAGTTC 2880
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CCGTATCAGT GACTCATTAG AGTTCAATTT TTATAGATAA TACAGATATT TTGGTAAATT 3240
GAACTTGGTT TTTCTTTCCC AGCATCGTGG ATGTAGACTG AGAATGGCTT TGAGTGGCAT 3300
CAGCTTCTCA CTGCTGTGGG CGGATGTCTT GGATAGATCA CGGGCTGGCT GAGCTGGACT 3360
TTGGTCAGCC TAGGTGAGAC TCACCTGTCC TTCTGGGGTC TTACTCCTCC TCAAGGAGTC 3420
TGTAGTGGAA AGGAGGCCAC AGAATAAGCT GCTTATTCTG AAACTTCAGC TTCCTCTAGC 3480
CCGGCCCTCT CTAAGGGAGC CCTCTGCACT CGTGTGCAGG CTCTGACCAG GCAGAACAGG 3540
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ACTCAGTTTC TCCACAGCCT TCTCCAGCCT GTGTGATACA AGTTTGATCC CAGGAACTTG 3660
AGTTCTAAGC AGTGCTCGTG AAAAAAAAAA GCAGAAAGAA TTAGAAATAA ATAAAAACTA 3720
AGCACTTCTG GAGACAT

SEQ ID NO:189 BCO2 Protein sequence
Protein Accession #: CAB92285

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| | | | | |
MGVAGRNRPG AAWAVLLLLL LLPPLLLLAG AVPPGRGRAA GPQEDVDECA QGLDDCHADA 60
LCQNTPTSYK CSCKPGYQGE GRQCEDIDEC GNELNGGCVH DCLNIPGNYR CTCFDGFMLA 120
HDGHNCLDVD ECLENNGGCQ HTCVNVMGSY ECCCKEGFFL SDNQHTCIHR SEEGLSCMNK 180
DHGCSHICKE APRGSVACEC RPGFELAKNQ RDCILTCNHG NGGCQHSCDD TADGPECSCH 240
PQYKMHTDGR SCLEREDTVL EVTESNTTSV VDGDKRVKRR LLMETCAVNN GGCDRTCKDT 300
STGVHCSCPV GFTLQLDGKT CKDIDECQTR NGGCDHFCKN IVGSFDCGCK KGFKLLTDEK 360
SCQDVDECSL DRTCDHSCIN HPGTFACACN RGYTLYGFTH CGDTNECSIN NGGCQQVCVN 420
TVGSYECQCH PGYKLHWNKK DCVEVKGLLP TSVSPRVSLH CGKSGGGDGC FLRCHSGIHL 480
SSDVTTIRTS VTFKLNEGKC SLKNAELFPE GLRPALPEKH SSVKESFRYV NLTCSSGKQV 540
PGAPGRPSTP KEMFITVEFE LETNQKEVTA SCDLSCIVKR TEKRLRKAIR TLRKAVHREQ 600
FHLQLSGMNL DVAKKPPRTS ERQAESCGVG QGHAENQCVS CRAGTYYDGA RERCILCPNG 660
TFQNEEGQMT CEPCPRPGNS GALKTPEAWN MSECGGLCQP GEYSADGFAP CQLCALGTFQ 720
PEAGRTSCFP CGGGLATKHQ GATSFQDCET RVQCSPGHFY NTTTHRCIRC PVGTYQPEFG 780
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PPPKRRILIV VPEIFLPIED DCGDYLVMRK TSSSNSVTTY ETCQTYERPI AFTSRSKKLW 900
IQFKSNEGNS ARGFQVPYVT YDEDYQELIE DIVRDGRLYA SENHQEILKD KKLIKALFDV 960
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SEQ ID NO:190 BFG1 DNA sequence
Nucleic Acid Accession #: AF007170
Coding sequence: 1-1725 (underlined sequences correspond to stop codon)

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CTGGAGATGC AGGCCATGAT GACCTTTGAC CCTCAGGACA TCCTGCTTGC CGGCAACATG 240
ATGAAGGAGG CACAGATGCT GTGTCAGAGG CACCGGAGGA AGTCTTCTGT AACAGATTCC 300
TTCAGCAGCC TGGTGAACCG CCCCACGCTG GGCCAATTCA CTGAAGAAGA AATCCACGCT 360
GAGGTCTGCT ATGCAGAGTG CCTGCTGCAG CGAGCAGCCC TGACCTTCCT GCAGGACGAG 420
AACATGGTGA GCTTCATCAA AGGCGGCATC AAAGTTCGAA ACAGCTACCA GACCTACAAG 480
GAGCTGGACA GCCTTGTTCA GTCCTCACAA TACTGCAAGG GTGAGAACCA CCCGCACTTT 540
GAAGGAGGAG TGAAGCTTGG TGTAGGGGCC TTCAACCTGA CACTGTCCAT GCTTCCTACT 600
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CAGCTGGAGG AGGGAGCGTC AGGGCACAGC TTCCGCTCTG TGCTCTGTGT CATGCTCCTG 720
CTGTGCTACC ACACCTTCCT CACCTTCGTG CTCGGTACTG GGAACGTCAA CATCGAGGAG 780
GCCGAGAAGC TCTTGAAGCC CTACCTGAAC CGGTACCCTA AGGGTGCCAT CTTCCTGTTC 840
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CCGGGCTGGA AGACAGAGAC AGCTGGACAG AGCTCCTGAA AACATTTCAA AATACCCCCT 1800
CCCCCTGCCC TGCCCTGCCT TTGGGGTCCA CCGGCACTCC AGTTGGATGG CACAACATAG 1860
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TATCATCTGG AGGTAAATCT CTTTATATGA TGATGCCAAA GGGCAAATTG CTTTTCAAAT 2160
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SEQ ID NO:191 BFG1 Protein sequence
Protein Accession #: AAC39582

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LLEFVGFSGN KDYGLLQLEE GASGHSFRSV LCVMLLLCYH TFLTFVLGTG NVNIEEAEKL 240
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KLKIAGKSLP TEKFAIRKSR RYFSSNPISL PVPALEMMYI WNGYAVIGKQ PKLTDGILEI 420
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SEQ ID NO:192 BFO6 DNA sequence
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Coding sequence: 1-4044 (underlined sequences correspond to start and stop codons)

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SEQ ID NO:193 BFO6 Protein sequence
Protein Accession #: NP_115972.1

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SEQ ID NO:194 BHB8 DNA sequence
Nucleic Acid Accession #: AA983251
Coding sequence: 1-1749 (underlined sequences correspond to start and stop codons)

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SEQ ID NO:195 BHB8 Protein sequence

Protein Accession #: none found

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SEQ ID NO:196 CQA5 DNA SEQUENCE

Nucleic Acid Accession #: AA088458

Coding sequence: 862-1995 (underlined sequences correspond to start and stop codons)

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GAGCAGCGTC CCTGGGCTCT ATCCGCGAGG TGCCAGTAGC GTGTGCAGGT ACATACACGT 2640
GCGTGCACAC TGTGATGACA CCCGGAAATG TCTCAGGATG TTGAAATGTG TCCTTGGGGG 2700
CAGAAGTGTC CCCAGTTGAG AATCTGCCCC AGAGGAACAC ACCCACACCA GGCCTCAGGA 2760
TTTTGTGTTG ATCAAGTTCC AAGGAAAAGG AACATCTCAG CCGGGCGTGG TGGTTCACGC 2820
CTGGAATCCC AGCACTTGAG GCCAGGAGTT CCAGAGCAGC CTGGGCAACG CAGTGAGAGA 2880
CCCCATCTCT ACAARAAAAA AAAAAGAAAG AAAGAAAATG AGAGATCCAG GTTTAAAAAT 2940
TCATAAACAC CACAAGGAAA CAATACACTA TGAGACCCAG CAGAAGCAAC AGATTGACTC 3000
TAGACCCAGA TACTAGAATT ATCAGAGAGA ATATAAAGTA ACAGTGTTTT ATATATCTAA 3060
AGAAATAAAA GAGATTTCTG GAAACATGAA AAAAAA
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SEQ ID NO:197 LBG2 DNA SEQUENCE

Nucleic Acid Accession #: X63629
Coding sequence: 54-2543 (start and stop codons are underlined)

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1         11        21        31        41        51
|         |         |         |         |         |
GCGGAACACC GGCCCGCCGT CGCGGCAGCT GCTTCACCCC TCTCTCTGCA GCCATGGGGC   60
TCCCTCGTGG ACCTCTCGCG TCTCTCCTCC TTCTCCAGGT TTGCTGGCTG CAGTGCGCGG  120
CCTCCGAGCC GTGCCGGGCG GTCTTCAGGG AGGCTGAAGT GACCTTGGAG GCGGGAGGCG  180
CGGAGCAGGA GCCCGGCCAG GCGCTGGGGA AAGTATTCAT GGGCTGCCCT GGGCAAGAGC  240
CAGCTCTGTT TAGCACTGAT AATGATGACT TCACTGTGCG GAATGGCGAG ACAGTCCAGG  300
AAAGAAGGTC ACTGAAGGAA AGGAATCCAT TGAAGATCTT CCCATCCAAA CGTATCTTAC  360
GAAGACACAA GAGAGATTGG GTGGTTGCTC CAATATCTGT CCCTGAAAAT GGCAAGGGTC  420
CCTTCCCCCA GAGACTGAAT CAGCTCAAGT CTAATAAAGA TAGAGACACC AAGATTTTCT  480
ACAGCATCAC GGGGCCGGGG GCAGACAGCC CCCCTGAGGG TGTCTTCGCT GTAGAGAAGG  540
AGACAGGCTG GTTGTTGTTG AATAAGCCAC TGGACCGGGA GGAGATTGCC AAGTATGAGC  600
TCTTTGGCCA CGCTGTGTCA GAGAATGGTG CCTCAGTGGA GGACCCCATG AACATCTCCA  660
TCATCGTGAC CGACCAGAAT GACCACAAGC CCAAGTTTAC CCAGGACACC TTCCGAGGGA  720
GTGTCTTAGA GGGAGTCCTA CCAGGTACTT CTGTGATGCA GGTGACAGCC ACAGATGAGG  780
ATGATGCCAT CTACACCTAC AATGGGGTGG TTGCTTACTC CATCCATAGC CAAGAACCAA  840
AGGACCCACA CGACCTCATG TTCACAATTC ACCGGAGCAC AGGCACCATC AGCGTCATCT  900
CCAGTGGCCT GGACCGGGAA AAAGTCCCTG AGTACACACT GACCATCCAG GCCACAGACA  960
TGGATGGGGA CGGCTCCACC ACCACGGCAG TGGCAGTAGT GGAGATCCTT GATGCCAATG 1020
ACAATGCTCC CATGTTTGAC CCCCAGAAGT ACGAGGCCCA TGTGCCTGAG AATGCAGTGG 1080
GCCATGAGGT GCAGAGGCTG ACGGTCACTG ATCTGGACGC CCCCAACTCA CCAGCGTGGC 1140
GTGCCACCTA CCTTATCATG GGCGGTGACG ACGGGGACCA TTTTACCATC ACCACCCACC 1200
CTGAGAGCAA CCAGGGCATC CTGACAACCA GGAAGGGTTT GGATTTTGAG GCCAAAAACC 1260
AGCACACCCT GTACGTTGAA GTGACCAACG AGGCCCCTTT TGTGCTGAAG CTCCCAACCT 1320
CCACAGCCAC CATAGTGGTC CACGTGGAGG ATGTGAATGA GGCACCTGTG TTTGTCCCAC 1380
CCTCCAAAGT CGTTGAGGTC CAGGAGGGCA TCCCCACTGG GGAGCCTGTG TGTGTCTACA 1440
CTGCAGAAGA CCCTGACAAG GAGAATCAAA AGATCAGCTA CCGCATCCTG AGAGACCCAG 1500
CAGGGTGGCT AGCCATGGAC CCAGACAGTG GGCAGGTCAC AGCTGTGGGC ACCCTCGACC 1560
GTGAGGATGA GCAGTTTGTG AGGAACAACA TCTATGAAGT CATGGTCTTG GCCATGGACA 1620
ATGGAAGCCC TCCCACCACT GGCACGGGAA CCCTTCTGCT AACACTGATT GATGTCAACG 1680
ACCATGGCCC AGTCCCTGAG CCCCGTCAGA TCACCATCTG CAACCAAAGC CCTGTGCGCC 1740
ACGTGCTGAA CATCACGGAC AAGGACCTGT CTCCCCACAC CTCCCCTTTC CAGGCCCAGC 1800
TCACAGATGA CTCAGACATC TACTGGACGG CAGAGGTCAA CGAGGAAGGT GACACAGTGG 1860
TCTTGTCCCT GAAGAAGTTC CTGAAGCAGG ATACATATGA CGTGCACCTT TCTCTGTCTG 1920
ACCATGGCAA CAAAGAGCAG CTGACGGTGA TCAGGGCCAC TGTGTGCGAC TGCCATGGCC 1980
ATGTCGAAAC CTGCCCTGGA CCCTGGAAAG GAGGTTTCAT CCTCCCTGTG CTGGGGGCTG 2040
TCCTGGCTCT GCTGTTCCTC CTGCTGGTGC TGCTTTTGTT GGTGAGAAAG AAGCGGAAGA 2100
TCAAGGAGCC CCTCCTACTC CCAGAAGATG ACACCCGTGA CAACGTCTTC TACTATGGCG 2160
AAGAGGGGGG TGGCGAAGAG GACCAGGACT ATGACATCAC CCAGCTCCAC CGAGGTCTGG 2220
AGGCCAGGCC GGAGGTGGTT CTCCGCAATG ACGTGGCACC AACCATCATC CCGACACCCA 2280
TGTACCGTCC TAGGCCAGCC AACCCAGATG AAATCGGCAA CTTTATAATT GAGAACCTGA 2340
AGGCGGCTAA CACAGACCCC ACAGCCCCGC CCTACGACAC CCTCTTGGTG TTCGACTATG 2400
AGGGCAGCGG CTCCGACGCC GCGTCCCTGA GCTCCCTCAC CTCCTCCGCC TCCGACCAAG 2460
ACCAAGATTA CGATTATCTG AACGAGTGGG GCAGCCGCTT CAAGAAGCTG GCAGACATGT 2520
ACGGTGGCGG GGAGGACGAC TAGGCGGCCT GCCTGCAGGG CTGGGGACCA AACGTCAGGC 2580
CACAGAGCAT CTCCAAGGGG TCTCAGTTCC CCCTTCAGCT GAGGACTTCG GAGCTTGTCA 2640
GGAAGTGGCC GTAGCAACTT GGCGGAGACA GGCTATGAGT CTGACGTTAG AGTGGTTGCT 2700
TCCTTAGCCT TTCAGGATGG AGGAATGTGG GCAGTTTGAC TTCAGCACTG AAAACCTCTC 2760
CACCTGGGCC AGGGTTGCCT CAGAGGCCAA GTTTCCAGAA GCCTCTTACC TGCCGTAAAA 2820
TGCTCAACCC TGTGTCCTGG GCCTGGGCCT GCTGTGACTG ACCTACAGTG GACTTTCTCT 2880
CTGGAATGGA ACCTTCTTAG GCCTCCTGGT GCAACTTAAT TTTTTTTTTT AATGCTATCT 2940
TCAAAACGTT AGAGAAAGTT CTTCAAAAGT GCAGCCCAGA GCTGCTGGGC CCACTGGCCG 3000
TCCTGCATTT CTGGTTTCCA GACCCCAATG CCTCCCATTC GGATGGATCT CTGCGTTTTT 3060
ATACTGAGTG TGCCTAGGTT GCCCCTTATT TTTTATTTTC CCTGTTGCGT TGCTATAGAT 3120
GAAGGGTGAG GACAATCGTG TATATGTACT AGAACTTTTT TATTAAAGAA A
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SEQ ID NO:198 LBG2 Protein sequence:
Protein Accession #: CAA45177

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1         11        21        31        41        51
|         |         |         |         |         |
MGLPRGPLAS LLLLQVCWLQ CAASEPCRAV FREAEVTLEA GGAEQEPGQA LGKVFMGCPG  60
QEPALFSTDN DDFTVRNGET VQERRSLKER NPLKIFPSKR ILRRHKRDWV VAPISVPENG 120
KGPFPQRLNQ LKSNKDRDTK IFYSITGPGA DSPPEGVFAV EKETGWLLLN KPLDREEIAK 180
YELFGHAVSE NGASVEDPMN ISIIVTDQND HKPKFTQDTF RGSVLEGVLP GTSVMQVTAT 240
DEDDAIYTYN GVVAYSIHSQ EPKDPHDLMF TIHRSTGTIS VISSGLDREK VPEYTLTIQA 300
TDMDGDGSTT TAVAVVEILD ANDNAPMFDP QKYEAHVPEN AVGHEVQRLT VTDLDAPNSP 360
AWRATYLIMG GDDGDHFTIT THPESNQGIL TTRKGLDFEA KNQHTLYVEV TNEAPFVLKL 420
PTSTATIVVH VEDVNEAPVF VPPSKVVEVQ EGIPTGEPVC VYTAEDPDKE NQKISYRILR 480
DPAGWLAMDP DSGQVTAVGT LDREDEQFVR NNIYEVMVLA MDNGSPPTTG TGTLLLTLID 540
VNDHGPVPEP RQITICNQSP VRHVLNITDK DLSPHTSPFQ AQLTDDSDIY WTAEVNEEGD 600
TVVLSLKKFL KQDTYDVHLS LSDHGNKEQL TVIRATVCDC HGHVETCPGP WKGGFILPVL 660
GAVLALLFLL LVLLLLVRKK RKIKEPLLLP EDDTRDNVFY YGEEGGGEED QDYDITQLHR 720
```

GLEARPEVVL RNDVAPTIIP TPMYRPRPAN PDEIGNFIIE NLKAANTDPT APPYDTLLVF 780
DYEGSGSDAA SLSSLTSSAS DQDQDYDYLN EWGSRFKKLA DMYGGGEDD

SEQ ID NO:199 OBI5 DNA SEQUENCE

Nucleic Acid Accession #: NM_012152
Coding sequence: 43-1104 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
|          |          |          |          |          |
CTTCTTTAAA TTTCTTTCTA GGATGTTCAC TTCTTCTCCA CAATGAATGA GTGTCACTAT    60
GACAAGCACA TGGACTTTTT TTATAATAGG AGCAACACTG ATACTGTCGA TGACTGGACA   120
GGAACAAAGC TTGTGATTGT TTTGTGTGTT GGGACGTTTT TCTGCCTGTT TATTTTTTTT   180
TCTAATTCTC TGGTCATCGC GGCAGTGATC AAAAACAGAA AATTTCATTT CCCCTTCTAC   240
TACCTGTTGG CTAATTTAGC TGCTGCCGAT TTCTTCGCTG GAATTGCCTA TGTATTCCTG   300
ATGTTTAACA CAGGCCCAGT TTCAAAAACT TTGACTGTCA ACCGCTGGTT TCTCCGTCAG   360
GGGCTTCTGG ACAGTAGCTT GACTGCTTCC CTCACCAACT TGCTGGTTAT CGCCGTGGAG   420
AGGCACATGT CAATCATGAG GATGCGGGTC CATAGCAACC TGACCAAAAA GAGGGTGACA   480
CTGCTCATTT TGCTTGTCTG GGCCATCGCC ATTTTTATGG GGGCGGTCCC CACACTGGGC   540
TGGAATTGCC TCTGCAACAT CTCTGCCTGC TCTTCCCTGG CCCCCATTTA CAGCAGGAGT   600
TACCTTGTTT TCTGGACAGT GTCCAACCTC ATGGCCTTCC TCATCATGGT TGTGGTGTAC   660
CTGCGGATCT ACGTGTACGT CAAGAGGAAA ACCAACGTCT TGTCTCCGCA TACAAGTGGG   720
TCCATCAGCC GCCGGAGGAC ACCCATGAAG CTAATGAAGA CGGTGATGAC TGTCTTAGGG   780
GCGTTTGTGG TATGCTGGAC CCCGGGCCTG GTGGTTCTGC TCCTCGACGG CCTGAACTGC   840
AGGCAGTGTG GCGTGCAGCA TGTGAAAAGG TGGTTCCTGC TGCTGGCGCT GCTCAACTCC   900
GTCGTGAACC CCATCATCTA CTCCTACAAG GACGAGGACA TGTATGGCAC CATGAAGAAG   960
ATGATCTGCT GCTTCTCTCA GGAGAACCCA GAGAGGCGTC CCTCTCGCAT CCCCTCCACA  1020
GTCCTCAGCA GGAGTGACAC AGGCAGCCAG TACATAGAGG ATAGTATTAG CCAAGGTGCA  1080
GTCTGCAATA AAAGCACTTC CTAAACTCTG GATGCCTCTC GGCCCACCCA GGTGATGACT  1140
GTCTTAGG
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__SEQ ID NO:200 OBI5 Protein sequence:__
Protein Accession #: NP_036284

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1          11         21         31         41         51
|          |          |          |          |          |
MNECHYDKHM DFFYNRSNTD TVDDWTGTKL VIVLCVGTFF CLFIFFSNSL VIAAVIKNRK    60
FHFPFYYLLA NLAAADFFAG IAYVFLMFNT GPVSKTLTVN RWFLRQGLLD SSLTASLTNL   120
LVIAVERHMS IMRMRVHSNL TKKRVTLLIL LVWAIAIFMG AVPTLGWNCL CNISACSSLA   180
PIYSRSYLVF WTVSNLMAFL IMVVVYLRIY VYVKRKTNVL SPHTSGSISR RRTPMKLMKT   240
VMTVLGAFVV CWTPGLVVLL LDGLNCRQCG VQHVKRWFLL LALLNSVVNP IIYSYKDEDM   300
YGTMKKMICC FSQENPERRP SRIPSTVLSR SDTGSQYIED SISQGAVCNK STS
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SEQ ID NO:201 PAA6 DNA SEQUENCE

Nucleic Acid Accession #: AA569531
Coding sequence: 1-504 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
|          |          |          |          |          |
ATGACCTACA GTTACTCATT TTTCAGGCCT GAGTTGATCG TTAATCATCT TAATTATGTT    60
CATTCTGAAG CCAACAGGAG AACCAAGACC AAAACTTTAT TGTCTCTGCT TTCATTTCTT   120
GATGAAACCT CTGGACTAAG CACACATCTT CCTTGTTTAT CTCTCTCAAA GGAGTGTGGA   180
GTGCTTCATC TGGACATCCA CGGGAAGAAG GAAGACATGA GAATCACCCA ACAGTCTTCC   240
CAGCTATACC TGTGGGACAT GGGTGGTTTT ACAATATTTA AGAACCTGTG GATGAGCCTC   300
ATACCCAGAG GGAACAAACG CTCCCCAAAA AGAGTTACAG AAACCATCCT GAGAGATTTT   360
AAGCAGAAGC AAAGTTCAAA GATCCAAGAG GAGAGACGAA GAGAGTCTGC AGGACCAAAC   420
CTCTCTTCAT TCTGGTTTGT GGGGAATGCT GGAAGAGGAG ACAGGCCCCA GATTTGGGCA   480
GGAAGTAAAC AGTTTTCAGG CTGAGGCCAA TCTGAGCAGG AACATTCCAA TATTTCTTCA   540
GCTACGTTGT CCCAGCACTT CACTGGTTAA CCTTTTATGT CCACCATTTG TGGATTTCAC   600
AGCTACTTGT CAATGGTGAA TATTGATCAT CATCATTATC TACTGAGCTG CTACCATATC   660
CCAGCTACTC CTTGCATGTT GTTCATTATT TTCTCAACAC TCAGCATATT TGCAATATGT   720
TATGTAATAT CACAGACAAG GAAACTGAAC GCAGAAATGT TTTATTTCTT GCCAAACATC   780
ACATGAGGAT GAACAATGAA ACCGATTTGA AACCAGGATT GTCTGATTCC AACATCTCTG   840
GGTCCTTTTT CACTCTGATA TGCTGCAATT AAAAAGCCAT TTCTAAGACT GT
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__SEQ ID NO:202 PAA6 Protein sequence:__
Protein Accession #: none found

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1          11         21         31         41         51
|          |          |          |          |          |
MTYSYSFFRP ELIVNHLNYV HSEANRRTKT KTLLSLLSFL DETSGLSTHL PCLSLSKECG    60
VLHLDIHGKK EDMRITQQSS QLYLWDMGGF TIFKNLWMSL IPRGNKRSPK RVTETILRDF   120
KQKQSSKIQE ERRRESAGPN LSSFWFVGNA GRGDRPQIWA GSKQFSG
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SEQ ID NO:203 PAB2 DNA SEQUENCE

Nucleic Acid Accession #: XM_050197
Coding sequence: 310-1971 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
|          |          |          |          |          |
TCACACGTGC CAAGGGGCTG GCTCAGCGGA ACCAGCCTGC ACGCGCTGGC TCCGGGTGAC     60
AGCCGCGCGC CTCGGCCAGG ATCTGAGTGA TGAGACGTGT CCCCACTGAG GTGCCCCACA    120
GCAGCAGGTG TTGAGCATGG GCTGAGAAGC TGGACCGGCA CCAAAGGGCT GGCAGAAATG    180
GGCGCCTGGC TGATTCCTAG GCAGTTGGCG GCAGCAAGGA GGAGAGGCCG CAGCTTCTGG    240
AGCAGAGCCG AGACGAAGCA GTTCTGGAGT GCCTGAACGG CCCCCTGAGC CCTACCCGCC    300
TGGCCCACTA TGGTCCAGAG GCTGTGGGTG AGCCGCCTGC TGCGGCACCG GAAAGCCCAG    360
CTCTTGCTGG TCAACCTGCT AACCTTTGGC CTGGAGGTGT GTTTGGCCGC AGGCATCACC    420
TATGTGCCGC CTCTGCTGCT GGAAGTGGGG GTAGAGGAGA AGTTCATGAC CATGGTGCTG    480
GGCATTGGTC CAGTGCTGGG CCTGGTCTGT GTCCCGCTCC TAGGCTCAGC CAGTGACCAC    540
TGGCGTGGAC GCTATGGCCG CCGCCGGCCC TTCATCTGGG CACTGTCCTT GGGCATCCTG    600
CTGAGCCTCT TTCTCATCCC AAGGGCCGGC TGGCTAGCAG GGCTGCTGTG CCCGGATCCC    660
AGGCCCCTGG AGCTGGCACT GCTCATCCTG GGCGTGGGGC TGCTGGACTT CTGTGGCCAG    720
GTGTGCTTCA CTCCACTGGA GGCCCTGCTC TCTGACCTCT TCCGGGACCC GGACCACTGT    780
CGCCAGGCCT ACTCTGTCTA TGCCTTCATG ATCAGTCTTG GGGGCTGCCT GGGCTACCTC    840
CTGCCTGCCA TTGACTGGGA CACCAGTGCC CTGGCCCCCT ACCTGGGCAC CCAGGAGGAG    900
TGCCTCTTTG GCCTGCTCAC CCTCATCTTC CTCACCTGCG TAGCAGCCAC ACTGCTGGTG    960
GCTGAGGAGG CAGCGCTGGG CCCCACCGAG CCAGCAGAAG GGCTGTCGGC CCCCTCCTTG   1020
TCGCCCCACT GCTGTCCATG CCGGGCCCGC TTGGCTTTCC GGAACCTGGG CGCCCTGCTT   1080
CCCCGGCTGC ACCAGCTGTG CTGCCGCATG CCCCGCACCC TGCGCCGGCT CTTCGTGGCT   1140
GAGCTGTGCA GCTGGATGGC ACTCATGACC TTCACGCTGT TTTACACGGA TTTCGTGGGC   1200
GAGGGGCTGT ACCAGGGCGT GCCCAGAGCT GAGCCGGGCA CCGAGGCCCG GAGACACTAT   1260
GATGAAGGCG TTCGGATGGG CAGCCTGGGG CTGTTCCTGC AGTGCGCCAT CTCCCTGGTC   1320
TTCTCTCTGG TCATGGACCG GCTGGTGCAG CGATTCGGCA CTCGAGCAGT CTATTTGGCC   1380
AGTGTGGCAG CTTTCCCTGT GGCTGCCGGT GCCACATGCC TGTCCCACAG TGTGGCCGTG   1440
GTGACAGCTT CAGCCGCCCT CACCGGGTTC ACCTTCTCAG CCCTGCAGAT CCTGCCCTAC   1500
ACACTGGCCT CCCTCTACCA CCGGGAGAAG CAGGTGTTCC TGCCCAAATA CCGAGGGGAC   1560
ACTGGAGGTG CTAGCAGTGA GGACAGCCTG ATGACCAGCT TCCTGCCAGG CCCTAAGCCT   1620
GGAGCTCCCT TCCCTAATGG ACACGTGGGT GCTGGAGGCA GTGGCCTGCT CCCACCTCCA   1680
CCCGCGCTCT GCGGGGCCTC TGCCTGTGAT GTCTCCGTAC GTGTGGTGGT GGGTGAGCCC   1740
ACCGAGGCCA GGGTGGTTCC GGGCCGGGGC ATCTGCCTGG ACCTCGCCAT CCTGGATAGT   1800
GCCTTCCTGC TGTCCCAGGT GGCCCCATCC CTGTTTATGG GCTCCATTGT CCAGCTCAGC   1860
CAGTCTGTCA CTGCCTATAT GGTGTCTGCC GCAGGCCTGG GTCTGGTCGC CATTTACTTT   1920
GCTACACAGG TAGTATTTGA CAAGAGCGAC TTGGCCAAAT ACTCAGCGTA GAAAACTTCC   1980
AGCACATTGG GGTGGAGGGC CTGCCTCACT GGGTCCCAGC TCCCCGCTCC TGTTAGCCCC   2040
ATGGGGCTGC CGGGCTGGCC GCCAGTTTCT GTTGCTGCCA AAGTAATGTG GCTCTCTGCT   2100
GCCACCCTGT GCTGCTGAGG TGCGTAGCTG CACAGCTGGG GGCTGGGGCG TCCCTCTCCT   2160
CTCTCCCCAG TCTCTAGGGC TGCCTGACTG GAGGCCTTCC AAGGGGGTTT CAGTCTGGAC   2220
TTATACAGGG AGGCCAGAAG GGCTCCATGC ACTGGAATGC GGGGACTCTG CAGGTGGATT   2280
ACCCAGGCTC AGGGTTAACA GCTAGCCTCC TAGTTGAGAC ACACCTAGAG AAGGGTTTTT   2340
GGGAGCTGAA TAAACTCAGT CACCTGGTTT CCCATCTCTA AGCCCCTTAA CCTGCAGCTT   2400
CGTTTAATGT AGCTCTTGCA TGGGAGTTTC TAGGATGAAA CACTCCTCCA TGGGATTTGA   2460
ACATATGAAA GTTATTTGTA GGGGAAGAGT CCTGAGGGGC AACACACAAG AACCAGGTCC   2520
CCTCAGCCCC ACAGGCACTG GTCTTTTTTG CTNGANTCCA CCCCCCCCCT CTTTACCCTT   2580
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SEQ ID NO:204 PAB2 Protein sequence:
Protein Accession #: XP_050197

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1          11         21         31         41         51
|          |          |          |          |          |
MVQRLWVSRL LRHRKAQLLL VNLLTFGLEV CLAAGITYVP PLLLEVGVEE KFMTMVLGIG     60
PVLGLVCVPL LGSASDHWRG RYGRRRPFIW ALSLGILLSL FLIPRAGWLA GLLCPDPRPL    120
ELALLILGVG LLDFCGQVCF TPLEALLSDL FRDPDHCRQA YSVYAFMISL GGCLGYLLPA    180
IDWDTSALAP YLGTQEECLF GLLTLIFLTC VAATLLVAEE AALGPTEPAE GLSAPSLSPH    240
CCPCRARLAF RNLGALLPRL HQLCCRMPRT LRRLFVAELC SWMALMTFTL FYTDFVGEGL    300
YQGVPRAEPG TEARRHYDEG VRMGSLGLFL QCAISLVFSL VMDRLVQRFG TRAVYLASVA    360
AFPVAAGATC LSHSVAVVTA SAALTGFTFS ALQILPYTLA SLYHREKQVF LPKYRGDTGG    420
ASSEDSLMTS FLPGPKPGAP FPNGHVGAGG SGLLPPPPAL CGASACDVSV RVVVGEPTEA    480
RVVPGRGICL DLAILDSAFL LSQVAPSLFM GSIVQLSQSV TAYMVSAAGL GLVAIYFATQ    540
VVFDKSDLAK YSA
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SEQ ID NO:205 PAJ3 DNA SEQUENCE

Nucleic Acid Accession #: AK002126
Coding sequence: 1-1593 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
|          |          |          |          |          |
ATGGTTCGCC GGGGGCTGCT TGCGTGGATT TCCCGGGTGG TGGTTTTGCT GGTGCTCCTC     60
TGCTGTGCTA TCTCTGTCCT GTACATGTTG GCCTGCACCC CAAAAGGTGA CGAGGAGCAG    120
CTGGCACTGC CCAGGGCCAA CAGCCCCACG GGGAAGGAGG GGTACCAGGC CGTCCTTCAG    180
GAGTGGGAGG AGCAGCACCG CAACTACGTG AGCAGCCTGA AGCGGCAGAT CGCACAGCTC    240
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AAGGAGGAGC TGCAGGAGAG GAGTGAGCAG CTCAGGAATG GGCAGTACCA AGCCAGCGAT   300
GCTGCTGGCC TGGGTCTGGA CAGGAGCCCC CCAGAGAAAA CCCAGGCCGA CCTCCTGGCC   360
TTCCTGCACT CGCAGGTGGA CAAGGCAGAG GTGAATGCTG GCGTCAAGCT GGCCACAGAG   420
TATGCAGCAG TGCCTTTCGA TAGCTTTACT CTACAGAAGG TGTACCAGCT GGAGACTGGC   480
CTTACCCGCC ACCCCGAGGA GAAGCCTGTG AGGAAGGACA AGCGGGATGA GTTGGTGGAA   540
GCCATTGAAT CAGCCTTGGA GACCCTGAAC AATCCTGCAG AGAACAGCCC CAATCACCGT   600
CCTTACACGG CCTCTGATTT CATAGAAGGG ATCTACCGAA CAGAAAGGGA CAAAGGGACA   660
TTGTATGAGC TCACCTTCAA AGGGGACCAC AAACACGAAT TCAAACGGCT CATCTTATTT   720
CGACCATTCG GCCCCATCAT GAAAGTGAAA AATGAAAAGC TCAACATGGC CAACACGCTT   780
ATCAATGTTA TCGTGCCTCT AGCAAAAAGG GTGGACAAGT TCCGGCAGTT CATGCAGAAT   840
TTCAGGGAGA TGTGCATTGA GCAGGATGGG AGAGTCCATC TCACTGTTGT TTACTTTGGG   900
AAAGAAGAAA TAAATGAAGT CAAAGGAATA CTTGAAAACA CTTCCAAAGC TGCCAACTTC   960
AGGAACTTTA CCTTCATCCA GCTGAATGGA GAATTTTCTC GGGGAAAGGG ACTTGATGTT  1020
GGAGCCCGCT TCTGGAAGGG AAGCAACGTC CTTCTCTTTT TCTGTGATGT GGACATCTAC  1080
TTCACATCTG AATTCCTCAA TACGTGTAGG CTGAATACAC AGCCAGGGAA GAAGGTATTT  1140
TATCCAGTTC TTTTCAGTCA GTACAATCCT GGCATAATAT ACGGCCACCA TGATGCAGTC  1200
CCTCCCTTGG AACAGCAGCT GGTCATAAAG AAGGAAACTG GATTTTGGAG AGACTTTGGA  1260
TTTGGGATGA CGTGTCAGTA TCGGTCAGAC TTCATCAATA TAGGTGGGTT TGATCTGGAC  1320
ATCAAAGGCT GGGGCGGAGA GGATGTGCAC CTTTATCGCA AGTATCTCCA CAGCAACCTC  1380
ATAGTGGTAC GGACGCCTGT GCGAGGACTC TTCCACCTCT GGCATGAGAA GCGCTGCATG  1440
GACGAGCTGA CCCCCGAGCA GTACAAGATG TGCATGCAGT CCAAGGCCAT GAACGAGGCA  1500
TCCCACGGCC AGCTGGGCAT GCTGGTGTTC AGGCACGAGA TAGAGGCTCA CCTTCGCAAA  1560
CAGAAACAGA AGACAAGTAG CAAAAAAACA TGA
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SEQ ID NO:206 PAJ3 Protein sequence:

Protein Accession #: NP_060841

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1          11         21         31         41         51
|          |          |          |          |          |
MVRRGLLAWI SRVVVLLVLL CCAISVLYML ACTPKGDEEQ LALPRANSPT GKEGYQAVLQ    60
EWEEQHRNYV SSLKRQIAQL KEELQERSEQ LRNGQYQASD AAGLGLDRSP PEKTQADLLA   120
FLHSQVDKAE VNAGVKLATE YAAVPFDSFT LQKVYQLETG LTRHPEEKPV RKDKRDELVE   180
AIESALETLN NPAENSPNHR PYTASDFIEG IYRTERDKGT LYELTFKGDH KHEFKRLILF   240
RPFGPIMKVK NEKLNMANTL INVIVPLAKR VDKFRQFMQN FREMCIEQDG RVHLTVVYFG   300
KEEINEVKGI LENTSKAANF RNFTFIQLNG EFSRGKGLDV GARFWKGSNV LLFFCDVDIY   360
FTSEFLNTCR LNTQPGKKVF YPVLFSQYNP GIIYGHHDAV PPLEQQLVIK KETGFWRDFG   420
FGMTCQYRSD FINIGGFDLD IKGWGGEDVH LYRKYLHSNL IVVRTPVRGL FHLWHEKRCM   480
DELTPEQYKM CMQSKAMNEA SHGQLGMLVF RHEIEAHLRK QKQKTSSKKT
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SEQ ID NO:207 PAJ5 DNA SEQUENCE

Nucleic Acid Accession #: AF189723

Coding sequence: 1-2712 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
|          |          |          |          |          |
ATGATTCCTG TATTGACATC AAAAAAAGCA AGTGAATTAC CAGTCAGTGA AGTTGCAAGC    60
ATTCTCCAAG CTGATCTTCA GAATGGTCTA AACAAATGTG AAGTTAGTCA TAGGCGAGCC   120
TTTCATGGCT GGAATGAGTT TGATATTAGT GAAGATGAGC CACTGTGGAA GAAGTATATT   180
TCTCAGTTTA AAAATCCCCT TATTATGCTG CTTCTGGCTT CTGCAGTCAT CAGTGTTTTA   240
ATGCATCAGT TTGATGATGC CGTCAGTATC ACTGTGGCAA TACTTATCGT TGTTACAGTT   300
GCCTTTGTTC AGGAATATCG TTCAGAAAAA TCTCTTGAAG AATTGAGTAA ACTTGTGCCA   360
CCAGAATGCC ATTGTGTGCG TGAAGGAAAA TTGGAGCATA CACTTGCCCG AGACTTGGTT   420
CCAGGTGATA CAGTTTGCCT TTCTGTTGGG GATAGAGTTC CTGCTGACTT ACGCTTGTTT   480
GAGGCTGTGG ATCTTTCCAT TGATGAGTCC AGCTTGACAG GTGAGACAAC GCCTTGTTCT   540
AAGGTGACAG CTCCTCAGCC AGCTGCAACT AATGGAGATC TTGCATCGAG AAGTAACATT   600
GCCTTTATGG GAACACTGGT CAGATGTGGC AAAGCAAAGG GTGTTGTCAT TGGAACAGGA   660
GAAAATTCTG AATTTGGGGA GGTTTTTAAA ATGATGCAAG CAGAAGAGGC ACCAAAAACC   720
CCTCTGCAGA AGAGCATGGA CCTCTTAGGA AAACAACTTT CCTTTTACTC CTTTGGTATA   780
ATAGGAATCA TCATGTTGGT TGGCTGGTTA CTGGGAAAAG ATATCCTGGA AATGTTTACT   840
ATTAGTGTAA GTTTGGCTGT AGCAGCAATT CCTGAAGGTC TCCCCATTGT GGTCACAGTG   900
ACGCTAGCTC TTGGTGTTAT GAGAATGGTG AAGAAAAGGG CCATTGTGAA AAAGCTGCCT   960
ATTGTTGAAA CTCTGGGCTG CTGTAATGTG ATTTGTTCAG ATAAAACTGG AACACTGACG  1020
AAGAATGAAA TGACTGTTAC TCACATATTT ACTTCAGATG GTCTGCATGC TGAGGTTACT  1080
GGAGTTGGCT ATAATCAATT TGGGGAAGTG ATTGTTGATG GTGATGTTGT TCATGGATTC  1140
TATAACCCAG CTGTTAGCAG AATTGTTGAG GCGGGCTGTG TGTGCAATGA TGCTGTAATT  1200
AGAAACAATA CTCTAATGGG GAAGCCAACA GAAGGGGCCT TAATTGCTCT TGCAATGAAG  1260
ATGGGTCTTG ATGGACTTCA ACAAGACTAC ATCAGAAAAG CTGAATACCC TTTTAGCTCT  1320
GAGCAAAAGT GGATGGCTGT TAAGTGTGTA CACCGAACAC AGCAGGACAG ACCAGAGATT  1380
TGTTTTATGA AAGGTGCTTA CGAACAAGTA ATTAAGTACT GTACTACATA CCAGAGCAAA  1440
GGGCAGACCT TGACACTTAC TCAGCAGCAG AGAGATGTGT ACCAACAAGA GAAGGCACGC  1500
ATGGGCTCAG CGGGACTCAG AGTTCTTGCT TTGGCTTCTG GTCCTGAACT GGGACAGCTG  1560
ACATTTCTTG GCTTGGTGGG AATCATTGAT CCACCTAGAA CTGGTGTGAA AGAAGCTGTT  1620
ACAACACTCA TTGCCTCAGG AGTATCAATA AAAATGATTA CTGGAGATTC ACAGGAGACT  1680
GCAGTTGCAA TCGCCAGTCG TCTGGGATTG TATTCCAAAA CTTCCCAGTC AGTCTCAGGA  1740
GAAGAAATAG ATGCAATGGA TGTTCAGCAG CTTTCACAAA TAGTACCAAA GGTTGCAGTA  1800
TTTTACAGAG CTAGCCCAAG GCACAAGATG AAAATTATTA AGTCGCTACA GAAGAACGGT  1860
TCAGTTGTAG CCATGACAGG AGATGGAGTA AATGATGCAG TTGCTCTGAA GGCTGCAGAC  1920
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ATTGGAGTTG CGATGGGCCA GACTGGTACA GATGTTTGCA AAGAGGCAGC AGACATGATC 1980
CTAGTGGATG ATGATTTTCA AACCATAATG TCTGCAATCG AAGAGGGTAA AGGGATTTAT 2040
AATAACATTA AAAATTTCGT TAGATTCCAG CTGAGCACGA GTATAGCAGC ATTAACTTTA 2100
ATCTCATTGG CTACATTAAT GAACTTTCCT AATCCTCTCA ATGCCATGCA GATTTTGTGG 2160
ATCAATATTA TTATGGATGG ACCCCCAGCT CAGAGCCTTG GAGTAGAACC AGTGGATAAA 2220
GATGTCATTC GTAAACCTCC TCGCAACTGG AAAGACAGCA TTTTGACTAA AAACTTGATA 2280
CTTAAAATAC TTGTTTCATC AATAATCATT GTTTGTGGGA CTTTGTTTGT CTTCTGGCGT 2340
GAGCTACGAG ACAATGTGAT TACACCTCGA GACACAACAA TGACCTTCAC ATGCTTTGTG 2400
TTTTTTGACA TGTTCAATGC ACTAAGTTCC AGATCCCAGA CCAAGTCTGT GTTTGAGATT 2460
GGACTCTGCA GTAATAGAAT GTTTTGCTAT GCAGTTCTTG GATCCATCAT GGGACAATTA 2520
CTAGTTATTT ACTTTCCTCC GCTTCAGAAG GTTTTTCAGA CTGAGAGCCT AAGCATACTG 2580
GATCTGTTGT TTCTTTTGGG TCTCACCTCA TCAGTGTGCA TAGTGGCAGA AATTATAAAG 2640
AAGGTTGAAA GGAGCAGGGA AAAGATCCAG AAGCATGTTA GTTCGACATC ATCATCTTTT 2700
CTTGAAGTAT GA
```

SEQ ID NO:208 PAJ5 Protein sequence:
Protein Accession #: AAF27813

```
1          11         21         31         41         51
|          |          |          |          |          |
MIPVLTSKKA SELPVSEVAS ILQADLQNGL NKCEVSHRRA FHGWNEFDIS EDEPLWKKYI   60
SQFKNPLIML LLASAVISVL MHQFDDAVSI TVAILIVVTV AFVQEYRSEK SLEELSKLVP  120
PECHCVREGK LEHTLARDLV PGDTVCLSVG DRVPADLRLF EAVDLSIDES SLTGETTPCS  180
KVTAPQPAAT NGDLASRSNI AFMGTLVRCG KAKGVVIGTG ENSEFGEVFK MMQAEEAPKT  240
PLQKSMDLLG KQLSFYSFGI IGIIMLVGWL LGKDILEMFT ISVSLAVAAI PEGLPIVVTV  300
TLALGVMRMV KKRAIVKKLP IVETLGCCNV ICSDKTGTLT KNEMTVTHIF TSDGLHAEVT  360
GVGYNQFGEV IVDGDVVHGF YNPAVSRIVE AGCVCNDAVI RNNTLMGKPT EGALIALAMK  420
MGLDGLQQDY IRKAEYPFSS EQKWMAVKCV HRTQQDRPEI CFMKGAYEQV IKYCTTYQSK  480
GQTLTLTQQQ RDVYQQEKAR MGSAGLRVLA LASGPELGQL TFLGLVGIID PPRTGVKEAV  540
TTLIASGVSI KMITGDSQET AVAIASRLGL YSKTSQSVSG EEIDAMDVQQ LSQIVPKVAV  600
FYRASPRHKM KIIKSLQKNG SVVAMTGDGV NDAVALKAAD IGVAMGQTGT DVCKEAADMI  660
LVDDDFQTIM SAIEEGKGIY NNIKNFVRFQ LSTSIAALTL ISLATLMNFP NPLNAMQILW  720
INIIMDGPPA QSLGVEPVDK DVIRKPPRNW KDSILTKNLI LKILVSSIII VCGTLFVFWR  780
ELRDNVITPR DTTMTFTCFV FFDMFNALSS RSQTKSVFEI GLCSNRMFCY AVLGSIMGQL  840
LVIYFPPLQK VFQTESLSIL DLLFLLGLTS SVCIVAEIIK KVERSREKIQ KHVSSTSSSF  900
LEV
```

SEQ ID NO:209 PAV4 VARIANT 1 DNA SEQUENCE

Nucleic Acid Accession #: N62098
Coding sequence: 1-1284 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
ATGGGCTACC AGAGGCAGGA GCCTGTCATC CCGCCGCAGA GAGGATTGCC TTATTCAATG   60
AAGCAAGCTG GGTTTCCTTT GGGAATATTG CTTTTATTCT GGGTTTCATA TGTTACAGAC  120
TTTTCCCTTG TTTTATTGAT AAAAGGAGGG GCCCTCTCTG GAACAGATAC CTACCAGTCT  180
TTGGTCAATA AAACTTTCGG CTTTCCAGGG TATCTGCTCC TCTCTGTTCT TCAGTTTTTG  240
TATCCTTTTA TAGCAATGAT AAGTTACAAT ATAATAGCTG GAGATACTTT GAGCAAAGTT  300
TTTCAAAGAA TCCCAGGAGT TGATCCTGAA AACGTGTTTA TTGGTCGCCA CTTCATTATT  360
GGACTTTCCA CAGTTACCTT TACTCTGCCT TTATCCTTGT ACCGAAATAT AGCAAAGCTT  420
GGAAAGGTCT CCCTCATCTC TACAGGTTTA ACAACTCTGA TTCTTGGAAT TGTAATGGCA  480
AGGGCAATTT CACTGGGTCC ACACATACCA AAAACAGAAG ACGCTTGGGT ATTTGCAAAG  540
CCCAATGCCA TTCAAGCGGT CGGGGTTATG TCTTTTGCAT TTATTTGCCA CCATAACTCC  600
TTCTTAGTTT ACAGTTCTCT AGAAGAACCC ACAGTAGCTA AGTGGTCCCG CCTTATCCAT  660
ATGTCCATCG TGATTTCTGT ATTTATCTGT ATATTCTTTG CTACATGTGG ATACTTGACA  720
TTTACTGGCT TCACCCAAGG GGACTTATTT GAAAATTACT GCAGAAATGA TGACCTGGTA  780
ACATTTGGAA GATTTTGTTA TGGTGTCACT GTCATTTTGA CATACCCTAT GGAATGCTTT  840
GTGACAAGAG AGGTAATTGC CAATGTGTTT TTTGGTGGGA ATCTTTCATC GGTTTTCCAC  900
ATTGTTGTAA CAGTGATGGT CATCACTGTA GCCACGCTTG TGTCATTGCT GATTGATTGC  960
CTCGGGATAG TTCTAGAACT CAATGGTGTG CTCTGTGCAA CTCCCCTCAT TTTTATCATT 1020
CCATCAGCCT GTTATCTGAA ACTGTCTGAA GAACCAAGGA CACACTCCGA TAAGATTATG 1080
TCTTGTGTCA TGCTTCCCAT TGGTGCTGTG GTGATGGTTT TTGGATTCGT CATGGCTATT 1140
ACAAATACTC AAGACTGCAC CCATGGGCAG GAAATGTTCT ACTGCTTTCC TGACAATTTC 1200
TCTCTCACAA ATACCTCAGA GTCTCATGTT CAGCAGACAA CACAACTTTC TACTTTAAAT 1260
ATTAGTATCT TTCAACTCGA GTAA
```

SEQ ID NO:210 PAV4 Variant 1 Protein sequence:
Protein Accession #: none found

```
1          11         21         31         41         51
|          |          |          |          |          |
MGYQRQEPVI PPQRGLPYSM KQAGFPLGIL LLFWVSYVTD FSLVLLIKGG ALSGTDTYQS   60
LVNKTFGFPG YLLLSVLQFL YPFIAMISYN IIAGDTLSKV FQRIPGVDPE NVFIGRHFII  120
GLSTVTFTLP LSLYRNIAKL GKVSLISTGL TTLILGIVMA RAISLGPHIP KTEDAWVFAK  180
PNAIQAVGVM SFAFICHHNS FLVYSSLEEP TVAKWSRLIH MSIVISVFIC IFFATCGYLT  240
FTGFTQGDLF ENYCRNDDLV TFGRFCYGVT VILTYPMECF VTREVIANVF FGGNLSSVFH  300
IVVTVMVITV ATLVSLLIDC LGIVLELNGV LCATPLFIII PSACYLKLSE EPRTHSDKIM  360
SCVMLPIGAV VMVFGFVMAI TNTQDCTHGQ EMFYCFPDNF SLTNTSESHV QQTTQLSTLN  420
```

ISIFQLE

SEQ ID NO:211 PAV4 VARIANT 2 DNA SEQUENCE

Nucleic Acid Accession #: N62096
Coding sequence: 1-1203 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
|          |          |          |          |          |
ATGGGCTACC AGAGGCAGGA GCCTGTCATC CCGCCGCAGT TTTCCCTTGT TTTATTGATA    60
AAAGGAGGGG CCCTCTCTGG AACAGATACC TACCAGTCTT TGGTCAATAA AACTTTCGGC   120
TTTCCAGGGT ATCTGCTCCT CTCTGTTCTT CAGTTTTTGT ATCCTTTTAT AGCAATGATA   180
AGTTACAATA TAATAGCTGG AGATACTTTG AGCAAAGTTT TTCAAAGAAT CCCAGGAGTT   240
GATCCTGAAA ACGTGTTTAT TGGTCGCCAC TTCATTATTG GACTTTCCAC AGTTACCTTT   300
ACTCTGCCTT TATCCTTGTA CCGAAATATA GCAAAGCTTG GAAAGGTCTC CCTCATCTCT   360
ACAGGTTTAA CAACTCTGAT TCTTGGAATT GTAATGGCAA GGGCAATTTC ACTGGGTCCA   420
CACATACCAA AAACAGAAGA CGCTTGGGTA TTTGCAAAGC CCAATGCCAT TCAAGCGGTC   480
GGGGTTATGT CTTTTGCATT TATTTGCCAC CATAACTCCT TCTTAGTTTA CAGTTCTCTA   540
GAAGAACCCA CAGTAGCTAA GTGGTCCCGC CTTATCCATA TGTCCATCGT GATTTCTGTA   600
TTTATCTGTA TATTCTTTGC TACATGTGGA TACTTGACAT TTACTGGCTT CACCCAAGGG   660
GACTTATTTG AAAATTACTG CAGAAATGAT GACCTGGTAA CATTTGGAAG ATTTTGTTAT   720
GGTGTCACTG TCATTTTGAC ATACCCTATG GAATGCTTTG TGACAAGAGA GGTAATTGCC   780
AATGTGTTTT TTGGTGGGAA TCTTTCATCG GTTTTCCACA TTGTTGTAAC AGTGATGGTC   840
ATCACTGTAG CCACGCTTGT GTCATTGCTG ATTGATTGCC TCGGGATAGT TCTAGAACTC   900
AATGGTGTGC TCTGTGCAAC TCCCCTCATT TTTATCATTC CATCAGCCTG TTATCTGAAA   960
CTGTCTGAAG AACCAAGGAC ACACTCCGAT AAGATTATGT CTTGTGTCAT GCTTCCCATT  1020
GGTGCTGTGG TGATGGTTTT TGGATTCGTC ATGGCTATTA CAAATACTCA AGACTGCACC  1080
CATGGGCAGG AAATGTTCTA CTGCTTTCCT GACAATTTCT CTCTCACAAA TACCTCAGAG  1140
TCTCATGTTC AGCAGACAAC ACAACTTTCT ACTTTAAATA TTAGTATCTT TCAACTCGAG  1200
TAA
```

SEQ ID NO:212 PAV4 Variant 2 Protein sequence:
Protein Accession #: none found

```
1          11         21         31         41         51
|          |          |          |          |          |
MGYQRQEPVI PPQFSLVLLI KGGALSGTDT YQSLVNKTFG FPGYLLLSVL QFLYPFIAMI    60
SYNIIAGDTL SKVFQRIPGV DPENVFIGRH FIIGLSTVTF TLPLSLYRNI AKLGKVSLIS   120
TGLTTLILGI VMARAISLGP HIPKTEDAWV FAKPNAIQAV GVMSFAFICH HNSFLVYSSL   180
EEPTVAKWSR LIHMSIVISV FICIFFATCG YLTFTGFTQG DLFENYCRND DLVTFGRFCY   240
GVTVILTYPM ECFVTREVIA NVFFGGNLSS VFHIVVTVMV ITVATLVSLL IDCLGIVLEL   300
NGVLCATPLI FIIPSACYLK LSEEPRTHSD KIMSCVMLPI GAVVMVFGFV MAITNTQDCT   360
HGQEMFYCFP DNFSLTNTSE SHVQQTTQLS TLNISIFQLE
```

SEQ ID NO:213 PAV4 VARIANT 3 DNA SEQUENCE

Nucleic Acid Accession #: N62096
Coding sequence: 1-1140 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
ATGGGCTACC AGAGGCAGGA GCCTGTCATC CCGCCGCAGG TCAATAAAAC TTTCGGCTTT    60
CCAGGGTATC TGCTCCTCTC TGTTCTTCAG TTTTTGTATC CTTTTATAGC AATGATAAGT   120
TACAATATAA TAGCTGGAGA TACTTTGAGC AAAGTTTTTC AAAGAATCCC AGGAGTTGAT   180
CCTGAAAACG TGTTTATTGG TCGCCACTTC ATTATTGGAC TTTCCACAGT TACCTTTACT   240
CTGCCTTTAT CCTTGTACCG AAATATAGCA AAGCTTGGAA AGGTCTCCCT CATCTCTACA   300
GGTTTAACAA CTCTGATTCT TGGAATTGTA ATGGCAAGGG CAATTTCACT GGGTCCACAC   360
ATACCAAAAA CAGAAGACGC TTGGGTATTT GCAAAGCCCA ATGCCATTCA AGCGGTCGGG   420
GTTATGTCTT TTGCATTTAT TTGCCACCAT AACTCCTTCT TAGTTTACAG TTCTCTAGAA   480
GAACCCACAG TAGCTAAGTG GTCCCGCCTT ATCCATATGT CCATCGTGAT TTCTGTATTT   540
ATCTGTATAT TCTTTGCTAC ATGTGGATAC TTGACATTTA CTGGCTTCAC CCAAGGGGAC   600
TTATTTGAAA ATTACTGCAG AAATGATGAC CTGGTAACAT TTGGAAGATT TTGTTATGGT   660
GTCACTGTCA TTTTGACATA CCCTATGGAA TGCTTTGTGA CAAGAGAGGT AATTGCCAAT   720
GTGTTTTTTG GTGGGAATCT TTCATCGGTT TTCCACATTG TTGTAACAGT GATGGTCATC   780
ACTGTAGCCA CGCTTGTGTC ATTGCTGATT GATTGCCTCG GGATAGTTCT AGAACTCAAT   840
GGTGTGCTCT GTGCAACTCC CCTCATTTTT ATCATTCCAT CAGCCTGTTA TCTGAAACTG   900
TCTGAAGAAC CAAGGACACA CTCCGATAAG ATTATGTCTT GTGTCATGCT TCCCATTGGT   960
GCTGTGGTGA TGGTTTTTGG ATTCGTCATG GCTATTACAA ATACTCAAGA CTGCACCCAT  1020
GGGCAGGAAA TGTTCTACTG CTTTCCTGAC AATTTCTCTC TCACAAATAC CTCAGAGTCT  1080
CATGTTCAGC AGACAACACA ACTTTCTACT TTAAATATTA GTATCTTTCA ACTCGAGTAA
```

SEQ ID NO:214 PAV4 Variant 3 Protein sequence:
Protein Accession #: none found

```
1          11         21         31         41         51
|          |          |          |          |          |
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```
MGYQRQEPVI PPQVNKTFGF PGYLLLSVLQ FLYPFIAMIS YNIIAGDTLS KVFQRIPGVD    60
PENVFIGRHF IIGLSTVTFT LPLSLYRNIA KLGKVSLIST GLTTLILGIV MARAISLGPH   120
IPKTEDAWVF AKPNAIQAVG VMSFAFICHH NSFLVYSSLE EPTVAKWSRL IHMSIVISVF   180
ICIFFATCGY LTFTGFTQGD LFENYCRNDD LVTFGRFCYG VTVILTYPME CFVTREVIAN   240
VFFGGNLSSV FHIVVTVMVI TVATLVSLLI DCLGIVLELN GVLCATPLIF IIPSACYLKL   300
SEEPRTHSDK IMSCVMLPIG AVVMVFGFVM AITNTQDCTH GQEMFYCFPD NFSLTNTSES   360
HVQQTTQLST LNISIFQLE
```

SEQ ID NO:215 PAV4 VARIANT 4 DNA SEQUENCE:

Nucleic Acid Accession #: N62096
Coding sequence: 1-1389 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
ATGGGCTACC AGAGGCAGGA GCCTGTCATC CCGCCGCAGA GAGATTTAGA TGACAGAGAA    60
ACCCTTGTTT CTGAACATGA GTATAAAGAG AAAACCTGTC AGTCTGCTGC TCTTTTTAAT   120
GTTGTCAACT CGATTATAGG ATCTGGTATA ATAGGATTGC CTTATTCAAT GAAGCAAGCT   180
GGGTTTCCTT TGGGAATATT GCTTTTATTC TGGGTTTCAT ATGTTACAGA CTTTTCCCTT   240
GTTTTATTGA TAAAAGGAGG GGCCCTCTCT GGAACAGATA CCTACCAGTC TTTGGTCAAT   300
AAAACTTTCG GCTTTCCAGG GTATCTGCTC CTCTCTGTTC TTCAGTTTTT GTATCCTTTT   360
ATAGCAATGA TAAGTTACAA TATAATAGCT GGAGATACTT TGAGCAAAGT TTTTCAAAGA   420
ATCCCAGGAG TTGATCCTGA AAACGTGTTT ATTGGTCGCC ACTTCATTAT TGGACTTTCC   480
ACAGTTACCT TTACTCTGCC TTTATCCTTG TACCGAAATA TAGCAAAGCT TGGAAAGGTC   540
TCCCTCATCT CTACAGGTTT AACAACTCTG ATTCTTGGAA TTGTAATGGC AAGGGCAATT   600
TCACTGGGTC CACACATACC AAAAACAGAA GACGCTTGGG TATTTGCAAA GCCCAATGCC   660
ATTCAAGCGG TCGGGGTTAT GTCTTTTGCA TTTATTTGCC ACCATAACTC CTTCTTAGTT   720
TACAGTTCTC TAGAAGAACC CACAGTAGCT AAGTGGTCCC GCCTTATCCA TATGTCCATC   780
GTGATTTCTG TATTTATCTG TATATTCTTT GCTACATGTG GATACTTGAC ATTTACTGGC   840
TTCACCCAAG GGGACTTATT TGAAAATTAC TGCAGAAATG ATGACCTGGT AACATTTGGA   900
AGATTTTGTT ATGGTGTCAC TGTCATTTTG ACATACCCTA TGGAATGCTT TGTGACAAGA   960
GAGGTAATTG CCAATGTGTT TTTTGGTGGG AATCTTTCAT CGGTTTTCCA CATTGTTGTA  1020
ACAGTGATGG TCATCACTGT AGCCACGCTT GTGTCATTGC TGATTGATTG CCTCGGGATA  1080
GTTCTAGAAC TCAATGGTGT GCTCTGTGCA ACTCCCCTCA TTTTTATCAT TCCATCAGCC  1140
TGTTATCTGA AACTGTCTGA AGAACCAAGG ACACACTCCG ATAAGATTAT GTCTTGTGTC  1200
ATGCTTCCCA TTGGTGCTGT GGTGATGGTT TTTGGATTCG TCATGGCTAT TACAAATACT  1260
CAAGACTGCA CCCATGGGCA GGAAATGTTC TACTGCTTTC CTGACAATTT CTCTCTCACA  1320
AATACCTCAG AGTCTCATGT TCAGCAGACA ACACAACTTT CTACTTTAAA TATTAGTATC  1380
TTTCAATGA
```

SEQ ID NO:216 PAV4 Variant 4 Protein sequence:

Protein Accession #: none found

```
1          11         21         31         41         51
|          |          |          |          |          |
MGYQRQEPVI PPQRDLDDRE TLVSEHEYKE KTCQSAALFN VVNSIIGSGI IGLPYSMKQA    60
GFPLGILLLF WVSYVTDFSL VLLIKGGALS GTDTYQSLVN KTFGFPGYLL LSVLQFLYPF   120
IAMISYNIIA GDTLSKVFQR IPGVDPENVF IGRHFIIGLS TVTFTLPLSL YRNIAKLGKV   180
SLISTGLTTL ILGIVMARAI SLGPHIPKTE DAWVFAKPNA IQAVGVMSFA FICHHNSFLV   240
YSSLEEPTVA KWSRLIHMSI VISVFICIFF ATCGYLTFTG FTQGDLFENY CRNDDLVTFG   300
RFCYGVTVIL TYPMECFVTR EVIANVFFGG NLSSVFHIVV TVMVITVATL VSLLIDCLGI   360
VLELNGVLCA TPLIFIIPSA CYLKLSEEPR THSDKIMSCV MLPIGAVVMV FGFVMAITNT   420
QDCTHGQEMF YCFPDNFSLT NTSESHVQQT TQLSTLNISI FQ
```

SEQ ID NO:217 PAV9 DNA SEQUENCE

Nucleic Acid Accession #: NM_017636
Coding sequence: 1-3501 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
ATGGAGGATG CCTTCGGGGC AGCCGTGGTG ACCGTGTGGG ACAGCGATGC ACACACCACG    60
GAGAAGCCCA CCGATGCCTA CGGAGAGCTG GACTTCACGG GGGCCGGCCG CAAGCACAGC   120
AATTTCCTCC GGCTCTCTGA CCGAACGGAT CCAGCTGCAG TTTATAGTCT GGTCACACGC   180
ACATGGGGCT TCCGTGCCCC GAACCTGGTG GTGTCAGTGC TGGGGGGATC GGGGGGCCCC   240
GTCCTCCAGA CCTGGCTGCA GGACCTGCTG CGTCGTGGGC TGGTGCGGGC TGCCCAGAGC   300
ACAGGAGCCT GGATTGTCAC TGGGGGTCTG CACACGGGCA TCGGCCGGCA TGTTGGTGTG   360
GCTGTACGGG ACCATCAGAT GGCCAGCACT GGGGGCACCA AGGTGGTGGC CATGGGTGTG   420
GCCCCCTGGG GTGTGGTCCG GAATAGAGAC ACCCTCATCA ACCCCAAGGG CTCGTTCCCT   480
GCGAGGTACC GGTGGCGCGG TGACCCGGAG GACGGGGTCC AGTTTCCCCT GGACTACAAC   540
TACTCGGCCT TCTTCCTGGT GGACGACGGC ACACACGGCT GCCTGGGGGG CGAGAACCGC   600
TTCCGCTTGC GCCTGGAGTC CTACATCTCA CAGCAGAAGA CGGGCGTGGG AGGGACTGGA   660
ATTGACATCC CTGTCCTGCT CCTCCTGATT GATGGTGATG AGAAGATGTT GACGCGAATA   720
GAGAACGCCA CCCAGGCTCA GCTCCCATGT CTCCTCGTGG CTGGCTCAGG GGGAGCTGCG   780
GACTGCCTGG CGGAGACCCT GGAAGACACT CTGGCCCCAG GGAGTGGGGG AGCCAGGCAA   840
GGCGAAGCCC GAGATCGAAT CAGGCGTTTC TTTCCCAAAG GGGACCTTGA GGTCCTGCAG   900
GCCCAGGTGG AGAGGATTAT GACCCGGAAG GAGCTCCTGA CAGTCTATTC TTCTGAGGAT   960
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GGGTCTGAGG AATTCGAGAC CATAGTTTTG AAGGCCCTTG TGAAGGCCTG TGGGAGCTCG  1020
GAGGCCTCAG CCTACCTGGA TGAGCTGCGT TTGGCTGTGG CTTGGAACCG CGTGGACATT  1080
GCCCAGAGTG AACTCTTTCG GGGGGACATC CAATGGCGGT CCTTCCATCT CGAAGCTTCC  1140
CTCATGGACG CCCTGCTGAA TGACCGGCCT GAGTTCGTGC GCTTGCTCAT TTCCCACGGC  1200
CTCAGCCTGG GCCACTTCCT GACCCCGATG CGCCTGGCCC AACTCTACAG CGCGGCGCCC  1260
TCCAACTCGC TCATCCGCAA CCTTTTGGAC CAGGCGTCCC ACAGCGCAGG CACCAAAGCC  1320
CCAGCCCTAA AAGGGGGAGC TGCGGAGCTC CGGCCCCCTG ACGTGGGGCA TGTGCTGAGG  1380
ATGCTGCTGG GGAAGATGTG CGCGCCGAGG TACCCCTCCG GGGGCGCCTG GGACCCTCAC  1440
CCAGGCCAGG GCTTCGGGGA GAGCATGTAT CTGCTCTCGG ACAAGGCCAC CTCGCCGCTC  1500
TCGCTGGATG CTGGCCTCGG GCAGGCCCCC TGGAGCGACC TGCTTCTTTG GGCACTGTTG  1560
CTGAACAGGG CACAGATGGC CATGTACTTC TGGGAGATGG GTTCCAATGC AGTTTCCTCA  1620
GCTCTTGGGG CCTGTTTGCT GCTCCGGGTG ATGGCACGCC TGGAGCCTGA CGCTGAGGAG  1680
GCAGCACGGA GGAAAGACCT GGCGTTCAAG TTTGAGGGGA TGGGCGTTGA CCTCTTTGGC  1740
GAGTGCTATC GCAGCAGTGA GGTGAGGGCT GCCCGCCTCC TCCTCCGTCG CTGCCCGCTC  1800
TGGGGGGATG CCACTTGCCT CCAGCTGGCC ATGCAAGCTG ACGCCCGTGC CTTCTTTGCC  1860
CAGGATGGGG TACAGTCTCT GCTGACACAG AAGTGGTGGG GAGATATGGC CAGCACTACA  1920
CCCATCTGGG CCCTGGTTCT CGCCTTCTTT TGCCCTCCAC TCATCTACAC CCGCCTCATC  1980
ACCTTCAGGA AATCAGAAGA GGAGCCCACA CGGGAGGAGC TAGAGTTTGA CATGGATAGT  2040
GTCATTAATG GGGAAGGGCC TGTCGGGACG GCGGACCCAG CCGAGAAGAC GCCGCTGGGG  2100
GTCCCGCGCC AGTCGGGCCG TCCGGGTTGC TGCGGGGGCC GCTGCGGGGG GCGCCGGTGC  2160
CTACGCCGCT GGTTCCACTT CTGGGGCGCG CCGGTGACCA TCTTCATGGG CAACGTGGTC  2220
AGCTACCTGC TGTTCCTGCT GCTTTTCTCG CGGGTGCTGC TCGTGGATTT CCAGCCGGCG  2280
CCGCCCGGCT CCCTGGAGCT GCTGCTCTAT TTCTGGGCTT TCACGCTGCT GTGCGAGGAA  2340
CTGCGCCAGG GCCTGAGCGG AGGCGGGGGC AGCCTCGCCA GCGGGGGCCC CGGGCCTGGC  2400
CATGCCTCAC TGAGCCAGCG CCTGCGCCTC TACCTCGCCG ACAGCTGGAA CCAGTGCGAC  2460
CTAGTGGCTC TCACCTGCTT CCTCCTGGGC GTGGGCTGCC GGCTGACCCC GGGTTTGTAC  2520
CACCTGGGCC GCACTGTCCT CTGCATCGAC TTCATGGTTT TCACGGTGCG GCTGCTTCAC  2580
ATCTTCACGG TCAACAAACA GCTGGGGCCC AAGATCGTCA TCGTGAGCAA GATGATGAAG  2640
GACGTGTTCT TCTTCCTCTT CTTCCTCGGC GTGTGGCTGG TAGCCTATGG CGTGGCCACG  2700
GAGGGGCTCC TGAGGCCACG GGACAGTGAC TTCCCAAGTA TCCTGCGCCG CGTCTTCTAC  2760
CGTCCCTACC TGCAGATCTT CGGGCAGATT CCCCAGGAGG ACATGGACGT GGCCCTCATG  2820
GAGCACAGCA ACTGCTCGTC GGAGCCCGGC TTCTGGGCAC ACCCTCCTGG GGCCCAGGCG  2880
GGCACCTGCG TCTCCCAGTA TGCCAACTGG CTGGTGGTGC TGCTCCTCGT CATCTTCCTG  2940
CTCGTGGCCA ACATCCTGCT GGTCAACTTG CTCATTGCCA TGTTCAGTTA CACATTCGGC  3000
AAAGTACAGG GCAACAGCGA TCTCTACTGG AAGGCGCAGC GTTACCGCCT CATCCGGGAA  3060
TTCCACTCTC GGCCCGCGCT GGCCCCGCCC TTTATCGTCA TCTCCCACTT GCGCCTCCTG  3120
CTCAGGCAAT TGTGCAGGCG ACCCCGGAGC CCCCAGCCGT CCTCCCCGGC CCTCGAGCAT  3180
TTCCGGGTTT ACCTTTCTAA GGAAGCCGAG CGGAAGCTGC TAACGTGGGA ATCGGTGCAT  3240
AAGGAGAACT TTCTGCTGGC ACGCGCTAGG GACAAGCGGG AGAGCGACTC CGAGCGTCTG  3300
AAGCGCACGT CCCAGAAGGT GGACTTGGCA CTGAAACAGC TGGGACACAT CCGCGAGTAC  3360
GAACAGCGCC TGAAAGTGCT GGAGCGGGAG GTCCAGCAGT GTAGCCGCGT CCTGGGGTGG  3420
GTGGCCGAGG CCCTGAGCCG CTCTGCCTTG CTGCCCCCAG GTGGGCCGCC ACCCCCTGAC  3480
CTGCCTGGGT CCAAAGACTG A
```

SEQ ID NO:218 PAV9 Protein sequence:

Protein Accession #: none found

```
1          11         21         31         41         51
|          |          |          |          |          |
MEDAFGAAVV TVWDSDAHTT EKPTDAYGEL DFTGAGRKHS NFLRLSDRTD PAAVYSLVTR    60
TWGFRAPNLV VSVLGGSGGP VLQTWLQDLL RRGLVRAAQS TGAWIVTGGL HTGIGRHVGV   120
AVRDHQMAST GGTKVVAMGV APWGVVRNRD TLINPKGSFP ARYRWRGDPE DGVQFPLDYN   180
YSAFFLVDDG THGCLGGENR FRLRLESYIS QQKTGVGGTG IDIPVLLLLI DGDEKMLTRI   240
ENATQAQLPC LLVAGSGGAA DCLAETLEDT LAPGSGGARQ GEARDRIRRF FPKGDLEVLQ   300
AQVERIMTRK ELLTVYSSED GSEEFETIVL KALVKACGSS EASAYLDELR LAVAWNRVDI   360
AQSELFRGDI QWRSFHLEAS LMDALLNDRP EFVRLLISHG LSLGHFLTPM RLAQLYSAAP   420
SNSLIRNLLD QASHSAGTKA PALKGGAAEL RPPDVGHVLR MLLGKMCAPR YPSGGAWDPH   480
PGQGFGESMY LLSDKATSPL SLDAGLGQAP WSDLLLWALL LNRAQMAMYF WEMGSNAVSS   540
ALGACLLLRV MARLEPDAEE AARRKDLAFK FEGMGVDLFG ECYRSSEVRA ARLLLRRCPL   600
WGDATCLQLA MQADARAFFA QDGVQSLLTQ KWWGDMASTT PIWALVLAFF CPPLIYTRLI   660
TFRKSEEEPT REELEFDMDS VINGEGPVGT ADPAEKTPLG VPRQSGRPGC CGGRCGGRRC   720
LRRWFHFWGA PVTIFMGNVV SYLLFLLLFS RVLLVDFQPA PPGSLELLLY FWAFTLLCEE   780
LRQGLSGGGG SLASGGPGPG HASLSQRLRL YLADSWNQCD LVALTCFLLG VGCRLTPGLY   840
HLGRTVLCID FMVFTVRLLH IFTVNKQLGP KIVIVSKMMK DVFFFLFFLG VWLVAYGVAT   900
EGLLRPRDSD FPSILRRVFY RPYLQIFGQI PQEDMDVALM EHSNCSSEPG FWAHPPGAQA   960
GTCVSQYANW LVVLLLVIFL LVANILLVNL LIAMFSYTFG KVQGNSDLYW KAQRYRLIRE  1020
FHSRPALAPP FIVISHLRLL LRQLCRRPRS PQPSSPALEH FRVYLSKEAE RKLLTWESVH  1080
KENFLLARAR DKRESDSERL KRTSQKVDLA LKQLGHIREY EQRLKVLERE VQQCSRVLGW  1140
VAEALSRSAL LPPGGPPPPD LPGSKD
```

SEQ ID NO:219 PBF1 DNA SEQUENCE

Nucleic Acid Accession #: AA054237

Coding sequence: 1-894 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
ATGGAGCCGC GGGCGCTCGT CACGGCGCTC AGCCTCGGCC TCAGCCTGTG CTCCCTGGGG    60
CTGCTCGTCA CGGCCATCTT CACCGACCAC TGGTACGAGA CCGACCCCCG GCGCCACAAG   120
GAGAGCTGCG AGCGCAGCCG CGCGGGCGCC GACCCCCCGG ACCAGAAGAA CCGCCTGATG   180
```

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CCGCTGTCGC ACCTGCCGCT GCGGGACTCG CCCCCGCTGG GGCGCCGGCT GCTCCCGGGC   240
GGCCCGGGGC GCGCCGACCC CGAGTCCTGG CGCTCGCTCC TGGGGCTCGG CGGGCTGGAC   300
GCCGAGTGCG GCCGGCCCCT CTTCGCCACC TACTCGGGCC TCTGGAGGAA GTGCTACTTC   360
CTGGGCATCG ACCGGGACAT CGACACCCTC ATCCTGAAAG GTATTGCGCA GCGATGCACG   420
GCCATCAAGT ACCACTTTTC TCAGCCCATC CGCTTGCGAA ACATTCCTTT TAATTTAACC   480
AAGACCATAC AGCAAGATGA GTGGCACCTG CTTCATTTAA GAAGAATCAC TGCTGGCTTC   540
CTCGGCATGG CCGTAGCCGT CCTTCTCTGC GGCTGCATTG TGGCCACAGT CAGTTTCTTC   600
TGGGAGGAGA GCTTGACCCA GCACGTGGCT GGACTCCTGT TCCTCATGAC AGGGATATTT   660
TGCACCATTT CCCTCTGTAC TTATGCCGCC AGTATCTCGT ATGATTTGAA CCGGCTCCCA   720
AAGCTAATTT ATAGCCTGCC TGCTGATGTG GAACATGGTT ACAGCTGGTC CATCTTTTGC   780
GCCTGGTGCA GTTTAGGCTT TATTGTGGCA GCTGGAGGTC TCTGCATCGC TTATCCGTTT   840
ATTAGCCGGA CCAAGATTGC ACAGCTAAAG TCTGGCAGAG ACTCCACGGT ATGA
```

<u>SEQ ID NO:220 PBF1 Protein sequence:</u>

Protein Accession #: none found

```
1          11         21         31         41         51
|          |          |          |          |          |
MEPRALVTAL SLGLSLCSLG LLVTAIFTDH WYETDPRRHK ESCERSRAGA DPPDQKNRLM    60
PLSHLPLRDS PPLGRRLLPG GPGRADPESW RSLLGLGGLD AECGRPLFAT YSGLWRKCYF   120
LGIDRDIDTL ILKGIAQRCT AIKYHFSQPI RLRNIPFNLT KTIQQDEWHL LHLRRITAGF   180
LGMAVAVLLC GCIVATVSFF WEESLTQHVA GLLFLMTGIF CTISLCTYAA SISYDLNRLP   240
KLIYSLPADV EHGYSWSIFC AWCSLGFIVA AGGLCIAYPF ISRTKIAQLK SGRDSTV
```

SEQ ID NO:221 PCI4 DNA SEQUENCE

Nucleic Acid Accession #: NM_016570

Coding sequence: 1- 1134 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
ATGAGGCGAC TGAATCGGAA AAAAACTTTA AGTTTGGTAA AAGAGTTGGA TGCCTTTCCG    60
AAGGTTCCTG AGAGCTATGT AGAGACTTCA GCCAGTGGAG GTACAGTTTC TCTAATAGCA   120
TTTACAACTA TGGCTTTATT AACCATAATG GAATTCTCAG TATATCAAGA TACATGGATG   180
AAGTATGAAT ACGAAGTAGA CAAGGATTTT TCTAGCAAAT TAAGAATTAA TATAGATATT   240
ACTGTTGCCA TGAAGTGTCA ATATGTTGGA GCGGATGTAT TGGATTTAGC AGAAACAATG   300
GTTGCATCTG CAGATGGTTT AGTTTATGAA CCAACAGTAT TTGATCTTTC ACCACAGCAG   360
AAAGAGTGGC AGAGGATGCT GCAGCTGATT CAGAGTAGGC TACAAGAAGA GCATTCACTT   420
CAAGATGTGA TATTTAAAAG TGCTTTTAAA AGTACATCAA CAGCTCTTCC ACCAAGAGAA   480
GATGATTCAT CACAGTCTCC AAATGCATGC AGAATTCATG GCCATCTATA TGTCAATAAA   540
GTAGCAGGGA ATTTTCACAT AACAGTGGGC AAGGCAATTC CACATCCTCG TGGTCATGCA   600
CATTTGGCAG CACTTGTCAA CCATGAATCT TACAATTTTT CTCATAGAAT AGATCATTTG   660
TCTTTTGGAG AGCTTGTTCC AGCAATTATT AATCCTTTAG ATGGAACTGA AAAAATTGCT   720
ATAGATCACA ACCAGATGTT CCAATATTTT ATTACAGTTG TGCCAACAAA ACTACATACA   780
TATAAAATAT CAGCAGACAC CCATCAGTTT TCTGTGACAG AAAGGGAACG TATCATTAAC   840
CATGCTGCAG GCAGCCATGG AGTCTCTGGG ATATTTATGA AATATGATCT CAGTTCTCTT   900
ATGGTGACAG TTACTGAGGA GCACATGCCA TTCTGGCAGT TTTTTGTAAG ACTCTGTGGT   960
ATTGTTGGAG GAATCTTTTC AACAACAGGC ATGTTACATG GAATTGGAAA ATTTATAGTT  1020
GAAATAATTT GCTGTCGTTT CAGACTTGGA TCCTATAAAC CTGTCAATTC TGTTCCTTTT  1080
GAGGATGGCC ACACAGACAA CCACTTACCT CTTTTAGAAA ATAATACACA TTGA
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<u>SEQ ID NO:222 PCI4 Protein sequence:</u>

Protein Accession #: NP_057654

```
1          11         21         31         41         51
|          |          |          |          |          |
MRRLNRKKTL SLVKELDAFP KVPESYVETS ASGGTVSLIA FTTMALLTIM EFSVYQDTWM    60
KYEYEVDKDF SSKLRINIDI TVAMKCQYVG ADVLDLAETM VASADGLVYE PTVFDLSPQQ   120
KEWQRMLQLI QSRLQEEHSL QDVIFKSAFK STSTALPPRE DDSSQSPNAC RIHGHLYVNK   180
VAGNFHITVG KAIPHPRGHA HLAALVNHES YNFSHRIDHL SFGELVPAII NPLDGTEKIA   240
IDHNQMFQYF ITVVPTKLHT YKISADTHQF SVTERERIIN HAAGSHGVSG IFMKYDLSSL   300
MVTVTEEHMP FWQFFVRLCG IVGGIFSTTG MLHGIGKFIV EIICCRFRLG SYKPVNSVPF   360
EDGHTDNHLP LLENNTH
```

SEQ ID NO:223 PEZ3 DNA SEQUENCE

Nucleic Acid Accession #: NM_001935.1

Coding sequence: 76-2301 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
CGCGCGTCTC CGCCGCCCGC GTGACTTCTG CCTGCGCTCC TTCTCTGAAC GCTCACTTCC    60
GAGGAGACGC CGACGATGAA GACACCGTGG AAGATTCTTC TGGGACTGCT GGGTGCTGCT   120
GCGCTTGTCA CCATCATCAC CGTGCCCGTG GTTCTGCTGA ACAAAGGCAC AGATGATGCT   180
ACAGCTGACA GTCGCAAAAC TTACACTCTA ACTGATTACT TAAAAAATAC TTATAGACTG   240
AAGTTATACT CCTTAAGATG GATTTCAGAT CATGAATATC TCTACAAACA AGAAAATAAT   300
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ATCTTGGTAT TCAATGCTGA ATATGGAAAC AGCTCAGTTT TCTTGGAGAA CAGTACATTT   360
GATGAGTTTG GACATTCTAT CAATGATTAT TCAATATCTC CTGATGGGCA GTTTATTCTC   420
TTAGAATACA ACTACGTGAA GCAATGGAGG CATTCCTACA CAGCTTCATA TGACATTTAT   480
GATTTAAATA AAAGGCAGCT GATTACAGAA GAGAGGATTC CAAACAACAC ACAGTGGGTC   540
ACATGGTCAC CAGTGGGTCA TAAATTGGCA TATGTTTGGA ACAATGACAT TTATGTTAAA   600
ATTGAACCAA ATTTACCAAG TTACAGAATC ACATGGACGG GGAAAGAAGA TATAATATAT   660
AATGGAATAA CTGACTGGGT TTATGAAGAG GAAGTCTTCA GTGCCTACTC TGCTCTGTGG   720
TGGTCTCCAA ACGGCACTTT TTTAGCATAT GCCCAATTTA ACGACACAGA AGTCCCACTT   780
ATTGAATACT CCTTCTACTC TGATGAGTCA CTGCAGTACC CAAAGACTGT ACGGGTTCCA   840
TATCCAAAGG CAGGAGCTGT GAATCCAACT GTAAAGTTCT TTGTTGTAAA TACAGACTCT   900
CTCAGCTCAG TCACCAATGC AACTTCCATA CAAATCACTG CTCCTGCTTC TATGTTGATA   960
GGGGATCACT ACTTGTGTGA TGTGACATGG GCAACACAAG AAAGAATTTC TTTGCAGTGG  1020
CTCAGGAGGA TTCAGAACTA TTCGGTCATG GATATTTGTG ACTATGATGA ATCCAGTGGA  1080
AGATGGAACT GCTTAGTGGC ACGGCAACAC ATTGAAATGA GTACTACTGG CTGGGTTGGA  1140
AGATTTAGGC CTTCAGAACC TCATTTTACC CTTGATGGTA ATAGCTTCTA CAAGATCATC  1200
AGCAATGAAG AAGGTTACAG ACACATTTGC TATTTCCAAA TAGATAAAAA AGACTGCACA  1260
TTTATTACAA AAGGCACCTG GGAAGTCATC GGGATAGAAG CTCTAACCAG TGATTATCTA  1320
TACTACATTA GTAATGAATA TAAAGGAATG CCAGGAGGAA GGAATCTTTA TAAAATCCAA  1380
CTTATTGACT ATACAAAAGT GACATGCCTC AGTTGTGAGC TGAATCCGGA AAGGTGTCAG  1440
TACTATTCTG TGTCATTCAG TAAAGAGGCG AAGTATTATC AGCTGAGATG TTCCGGTCCT  1500
GGTCTGCCCC TCTATACTCT ACACAGCAGC GTGAATGATA AAGGGCTGAG AGTCCTGGAA  1560
GACAATTCAG CTTTGGATAA AATGCTGCAG AATGTCCAGA TGCCCTCCAA AAAACTGGAC  1620
TTCATTATTT TGAATGAAAC AAAATTTTGG TATCAGATGA TCTTGCCTCC TCATTTTGAT  1680
AAATCCAAGA AATATCCTCT ACTATTAGAT GTGTATGCAG GCCCATGTAG TCAAAAAGCA  1740
GACACTGTCT TCAGACTGAA CTGGGCCACT TACCTTGCAA GCACAGAAAA CATTATAGTA  1800
GCTAGCTTTG ATGGCAGAGG AAGTGGTTAC CAAGGAGATA AGATCATGCA TGCAATCAAC  1860
AGAAGACTGG GAACATTTGA AGTTGAAGAT CAAATTGAAG CAGCCAGACA ATTTTCAAAA  1920
ATGGGATTTG TGGACAACAA ACGAATTGCA ATTTGGGGCT GGTCATATGG AGGGTACGTA  1980
ACCTCAATGG TCCTGGGATC GGGAAGTGGC GTGTTCAAGT GTGGAATAGC CGTGGCGCCT  2040
GTATCCCGGT GGGAGTACTA TGACTCAGTG TACACAGAAC GTTACATGGG TCTCCCAACT  2100
CCAGAAGACA ACCTTGACCA TTACAGAAAT TCAACAGTCA TGAGCAGAGC TGAAAATTTT  2160
AAACAAGTTG AGTACCTCCT TATTCATGGA ACAGCAGATG ATAACGTTCA CTTTCAGCAG  2220
TCAGCTCAGA TCTCCAAAGC CCTGGTCGAT GTTGGAGTGG ATTTCCAGGC AATGTGGTAT  2280
ACTGATGAAG ACCATGGAAT AGCTAGCAGC ACAGCACACC AACATATATA TACCCACATG  2340
AGCCACTTCA TAAAACAATG TTTCTCTTTA CCTTAGCACC TCAAAATACC ATGCCATTTA  2400
AAGCTTATTA AAACTCATTT TTGTTTTCAT TATCTCAAAA CTGCACTGTC AAGATGATGA  2460
TGATCTTTAA AATACACACT CAAATCAAGA AACTTAAGGT TACCTTTGTT CCCAAATTTC  2520
ATACCTATCA TCTTAAGTAG GGACTTCTGT CTTCACAACA GATTATTACC TTACAGAAGT  2580
TTGAATTATC CGGTCGGGTT TTATTGTTTA AAATCATTTC TGCATCAGCT GCTGAAACAA  2640
CAAATAGGAA TTGTTTTTAT GGAGGCTTTG CATAGATTCC CTGAGCAGGA TTTTAATCTT  2700
TTTCTAACTG GACTGGTTCA AATGTTGTTC TCTTCTTTAA AGGGATGGCA AGATGTGGGC  2760
AGTGATGTCA CTAGGGCAGG GACAGGATAA GAGGGATTAG GGAGAGAAGA TAGCAGGGCA  2820
TGGCTGGGAA CCCAAGTCCA AGCATACCAA CACGAGCAGG CTACTGTCAG CTCCCCTCGG  2880
AGAAGAGCTG TTCACCACGA GACTGGCACA GTTTTCTGAG AAAGACTATT CAAACAGTCT  2940
CAGGAAATCA AATATCGAAA GCACTGACTT CTAAGTAAAC CACAGCAGTT GAAAGACTCC  3000
AAAGAAATGT AAGGGAAACT GCCAGCAACG CAGCCCCCAG GTGCCAGTTA TGGCTATAGG  3060
TGCTACAAAA ACACAGCAAG GGTGATGGGA AAGCATTGTA AATGTGCTTT TAAAAAAAAA  3120
TACTGATGTT CCTAGTGAAA GAGGCAGCTT GAAACTGAGA TGTGAACACA TCAGCTTGCC  3180
CTGTTAAAAG ATGAAAATAT TTGTATCACA AATCTTAACT TGAAGGAGTC CTTGCATCAA  3240
TTTTTCTTAT TTCATTTCTT TGAGTGTCTT AATTAAAAGA ATATTTTAAC TTCCTTGGAC  3300
TCATTTTAAA AAATGGAACA TAAAATACAA TGTTATGTAT TATTATTCCC ATTCTACATA  3360
CTATGGAATT TCTCCCAGTC ATTTAATAAA TGTGCCTTCA TTTTTTC
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SEQ ID NO:224 PEZ3 Protein sequence:

Protein Accession #: NP_001926.1

```
1          11         21         31         41         51
|          |          |          |          |          |
MKTPWKILLG LLGAAALVTI ITVPVVLLNK GTDDATADSR KTYTLTDYLK NTYRLKLYSL    60
RWISDHEYLY KQENNILVFN AEYGNSSVFL ENSTFDEFGH SINDYSISPD GQFILLEYNY   120
VKQWRHSYTA SYDIYDLNKR QLITEERIPN NTQWVTWSPV GHKLAYVWNN DIYVKIEPNL   180
PSYRITWTGK EDIIYNGITD WVYEEEVFSA YSALWWSPNG TFLAYAQFND TEVPLIEYSF   240
YSDESLQYPK TVRVPYPKAG AVNPTVKFFV VNTDSLSSVT NATSIQITAP ASMLIGDHYL   300
CDVTWATQER ISLQWLRRIQ NYSVMDICDY DESSGRWNCL VARQHIEMST TGWVGRFRPS   360
EPHFTLDGNS FYKIISNEEG YRHICYFQID KKDCTFITKG TWEVIGIEAL TSDYLYYISN   420
EYKGMPGGRN LYKIQLIDYT KVTCLSCELN PERCQYYSVS FSKEAKYYQL RCSGPGLPLY   480
TLHSSVNDKG LRVLEDNSAL DKMLQNVQMP SKKLDFIILN ETKFWYQMIL PPHFDKSKKY   540
PLLLDVYAGP CSQKADTVFR LNWATYLAST ENIIVASFDG RGSGYQGDKI MHAINRRLGT   600
FEVEDQIEAA RQFSKMGFVD NKRIAIWGWS YGGYVTSMVL GSGSGVFKCG IAVAPVSRWE   660
YYDSVYTERY MGLPTPEDNL DHYRNSTVMS RAENFKQVEY LLIHGTADDN VHFQQSAQIS   720
KALVDVGVDF QAMWYTDEDH GIASSTAHQH IYTHMSHFIK QCFSLP
```

SEQ ID NO:225 PBJ2 DNA SEQUENCE

Nucleic Acid Accession #: none found

Coding sequence: 1-261 (underlined sequences correspond to start and stop codons)

```
1          11         21         31         41         51
|          |          |          |          |          |
```

ATGGCTCTGG CGAAGGTGAG GGAGCCAAAC GCAAATGACA ATGCCATCAG AGTTGACAAC 60
AGAAGTGTGA TTAAAGTGCG TGCTAACCAG TGTTCCCTGC ATGAGGCAGA AAGTGAATCC 120
AGAAACCCTC AGGAGCTCTG GATGGGCCTG CTCCTCTTGA TGGGGGTCCT AGAAGCATGT 180
GTGGAAATGA GGCCTCTGTC AGTCTGGTCC CTGAGAGATG ACAAGGAGCA GAGCCCCCAC 240
CAGCCCACAC TGGATGTCTA A

SEQ ID NO:226 PBJ2 Protein sequence:
Protein Accession #: none found

1 11 21 31 41 51
MALAKVREPN ANDNAIRVDN RSVIKVRANQ CSLHEAESES RNPQELWMGL LLLMGVLEAC 60
VEMRPLSVWS LRDDKEQSPH QPTLDV

SEQ ID NO:227 PBM2 DNA SEQUENCE

Nucleic Acid Accession #: none found
Coding sequence: 1-462 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
ATGCCAAATG CTGAGTTAGA AGCAAAGAGC CTTGGAAGCA GTAAATGTTT AAAAACTGCT 60
CTCATACTTG CTGTATGTTG TGGATCAGCA AATATAGTCA GCCCTCTACT TGAGCAAAAT 120
ATTGATGTAT CTTCTCAAGA TCTGGACAGA CGGCCAGAGA GTATGCTGTT TCTAGTCATC 180
ATCATGTGGA CCAGTTTTGT GGAAGACAAT CTTTCCATGG GCTGGGGGAA GCTAGAAGAT 240
TTTATGGCTA TTGAAGAAGA AATGAAGAAG CACGGAAGTA CTCATGTGGG ATTCCCAGAA 300
AACCTGACTA ATGGTGCCGC TGCTGGCAAT GGTGATGATG GATTAATTCC TCCAAGGAAG 360
AGCAGAACAC CTGAAAGCCA GCAATTTCCT GACACTGAGA ATGAAGAGTA TCACAGGTTT 420
GTCAAAGATC AGATAGTTGT AGATATGCGG CGTTATTTCT GA

SEQ ID NO:228 PBM2 Protein sequence:
Protein Accession #: none found

1 11 21 31 41 51
MFNAELEAKS LGSSKCLKTA LILAVCCGSA NIVSPLLEQN IDVSSQDLDR RPESMLFLVI 60
IMWTSFVEDN LSMGWGKLED FMAIEEEMKK HGSTHVGFPE NLTNGAAAGN GDDGLIPPRK 120
SRTPESQQFP DTENEEYHRF VKDQIVVDMR RYF

SEQ ID NO:229 PEZ2 DNA SEQUENCE

Nucleic Acid Accession #: NM_014253
Coding sequence: 65-8242 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
GACTGCTTGC ATTAAAGGAC TTCCTCATCC TTTTTTTCAT GAAACTGAGC TTGCTTAATC 60
AGAGATGGAG CAAACTGACT GCAAACCCTA CCAGCCTCTA CCAAAAGTCA AGCATGAAAT 120
GGATCTAGCT TACACCAGTT CTTCTGATGA GAGTGAAGAT GGAAGAAAAC CAAGACAGTC 180
ATACAACTCC AGGGAGACCC TGCACGAGTA TAACCAGGAG CTGAGGATGA ATTACAATAG 240
CCAGAGTAGA AAGAGGAAAG AAGTAGAAAA ATCTACTCAA GAGATGGAAT TCTGTGAAAC 300
CTCTCACACT CTGTGCTCTG GCTACCAAAC AGACATGCAC AGCGTTTCTC GGCATGGCTA 360
CCAGCTAGAG ATGGGATCTG ATGTGGACAC AGAGACAGAA GGTGCTGCCT CACCTGACCA 420
TGCACTAAGA ATGTGGATAA GGGGAATGAA ATCAGAGCAT AGTTCCTGTT TGTCCAGCCG 480
GGCCAACTCT GCATTATCCT TGACTGACAC TGACCATGAA AGGAAGTCTG ATGGGGAAAA 540
TGGTTTCAAA TTCTCTCCTG TTTGTTGTGA CATGGAGGCT CAAGCTGGGT CTACTCAAGA 600
TGTGCAGAGC AGCCCACACA ACCAGTTCAC CTTCAGACCC CTCCCACCGC CACCTCCGCC 660
TCCTCATGCC TGCACCTGTG CCAGGAAGCC ACCCCCTGCA GCGGACTCTC TTCAGAGGAG 720
ATCAATGACT ACCCGCAGCC AGCCCAGCCC AGCTGCTCCA GCTCCCCCAA CCAGCACGCA 780
GGATTCAGTC CATCTGCATA ACAGCTGGGT CCTGAACAGC AACATACCAT TGGAGACCAG 840
GCATTCCCTG TTCAAACATG GATCTGGTTC CTCTGCGATC TTCAGTGCAG CCAGTCAGAA 900
CTACCCTCTG ACATCCAATA CCGTGTACTC GCCCCCTCCC AGGCCTCTTC CTCGAAGCAC 960
CTTTTCCCGA CCTGCCTTTA CCTTTAACAA ACCTTACAGG TGCTGCAACT GGAAGTGCAC 1020
AGCATTGAGC GCCACTGCAA TCACAGTGAC TTTGGCCTTG TTACTAGCCT ATGTGATTGC 1080
AGTGCATTTG TTCGGCCTGA CTTGGCAGTT GCAACCAGTT GAAGGAGAGC TGTATGCAAA 1140
TGGAGTTAGC AAAGGGAACA GGGGGACCGA GTCCATGGAC ACTACTTACT CTCCAATTGG 1200
AGGAAAAGTT TCTGATAAAT CAGAGAAAAA AGTGTTTCAG AAGGGACGGG CGATAGACAC 1260
TGGAGAAGTT GACATTGGTG CACAGGTCAT GCAGACCATT CCACCTGGTT TATTCTGGCG 1320
TTTCCAGATT ACTATCCACC ATCCAATATA TCTGAAGTTC AATATTTCTT TAGCCAAGGA 1380
CTCTCTGCTG GGAATTTATG GCAGAAGAAA CATTCCACCT ACACATACTC AGTTTGATTT 1440
TGTAAAACTA ATGGATGGCA AACAGCTGGT CAAGCAGGAC TCCAAGGGCT CTGATGATAC 1500
ACAGCACTCC CCTCGGAACC TGATCTTAAC TTCGCTTCAG GAGACAGGTT TCATAGAGTA 1560
TATGGATCAA GGACCTTGGT ATCTGGCGTT TTACAATGAT GGAAAAAAGA TGGAGCAAGT 1620
ATTCGTGTTA ACTACAGCAA TTGAAATAAT GGATGACTGT TCAACCAATT GCAATGGAAA 1680
TGGAGAGTGT ATCTCTGGCC ATTGTCATTG TTTCCCAGGA TTCCTTGGAC CTGACTGTGC 1740
TAGAGATTCC TGCCCTGTGC TGTGTGGTGG GAATGGAGAA TACGAGAAAG GACACTGTGT 1800
CTGCCGGCAT GGCTGGAAGG GGCCAGAGTG TGACGTTCCG GAAGAACAAT GCATTGATCC 1860
AACATGCTTT GGCCACGGCA CCTGCATCAT GGGAGTCTGC ATCTGTGTGC CAGGATACAA 1920

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AGGAGAAATA TGCGAGGAAG AGGACTGCCT AGACCCAATG TGTTCCAACC ATGGCATCTG 1980
TGTAAAAGGA GAATGTCACT GTTCTACTGG CTGGGGAGGA GTTAACTGTG AAACACCACT 2040
TCCTGTATGT CAAGAGCAGT GCTCAGGACA CGGAACTTTT CTTCTGGACG CTGGAGTATG 2100
CAGCTGTGAT CCCAAGTGGA CAGGATCTGA CTGCTCAACA GAGCTGTGTA CCATGGAGTG 2160
TGGTAGCCAT GGAGTCTGCT CAAGAGGAAT TTGCCAGTGT GAAGAAGGCT GGGTAGGACC 2220
AACATGTGAG GAACGCTCCT GTCATTCTCA TTGTACTGAG CATGGCCAAT GCAAAGATGG 2280
AAAATGTGAG TGTAGCCCTG GATGGGAGGG CGACCACTGC ACAATTGCTC ACTACTTAGA 2340
TGCTGTCCGA GATGGCTGCC CAGGGCTCTG CTTTGGAAAT GGACGATGTA CCCTGGATCA 2400
AAATGGTTGG CACTGTGTGT GTCAGGTGGG TTGGAGTGGG ACAGGCTGCA ATGTTGTCAT 2460
GGAAATGCTT TGTGGAGATA ACTTGGACAA TGATGGAGAT GGTTTAACCG ACTGTGTGGA 2520
TCCTGACTGT TGTCAACAAA GCAACTGTTA TATAAGTCCT CTCTGCCAGG GCTCACCAGA 2580
TCCTCTTGAC CTCATTCAGC AAAGCCAAAC TCTCTTCTCT CAGCACACTT CAAGACTTTT 2640
TTATGATCGA ATCAAATTCC TCATTGGCAA GGACAGTACT CATGTCATTC CTCCTGAGGT 2700
GTCATTTGAC AGCAGGCGTG CCTGTGTGAT TCGAGGCCAA GTGGTGGCCA TAGATGGAAC 2760
TCCTCTAGTG GGAGTGAATG TCAGTTTCTT GCACCACAGT GATTATGGGT TTACCATCAG 2820
CCGGCAAGAT GGAAGCTTTG ACCTCGTGGC CATCGGTGGC ATCTCTGTCA TCTTAATCTT 2880
CGACCGATCC CCTTTCCTGC CTGAGAAGAG AACACTCTGG TTGCCTTGGA ATCAGTTTAT 2940
TGTGGTAGAG AAAGTCACCA TGCAGAGAGT TGTATCAGAC CCGCCATCCT GCGATATCTC 3000
CAACTTTATC AGCCCAAACC CTATTGTGCT TCCTTCACCG CTCACATCAT TTGGAGGGTC 3060
CTGTCCAGAG AGGGGAACTA TTGTTCCTGA GCTGCAGGTT GTACAGGAGG AAATTCCCAT 3120
TCCCTCCAGC TTTGTGAGGC TGAGTTACCT GAGCAGCCGC ACCCCTGGGT ATAAAACCCT 3180
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Coding sequence: 225-2567 (underlined sequences correspond to start and stop codons)

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AGAAGTCGGT CTTGGCAGCT GTTGTAATTG CCAACCTGAA AGGGATGTTT ATGCAGCTGT  1620
GTGACATTCC TCGTCTGTGG AGACAGAATA AGATTGATGC TGTTATCTGG GTGTTTACGT  1680
GTATAGTGTC CATCATTCTG GGGCTGGATC TCGGTTTACT AGCTGGCCTT ATATTTGGAC  1740
TGTTGACTGT GGTCCTGAGA GTTCAGTTTC CTTCTTGGAA TGGCCTTGGA AGCATCCCTA  1800
GCACAGATAT CTACAAAAGT ACCAAGAATT ACAAAAACAT TGAAGAACCT CAAGGAGTGA  1860
AGATTCTTAG ATTTTCCAGT CCTATTTTCT ATGGCAATGT CGATGGTTTT AAAAAATGTA  1920
TCAAGTCCAC AGTTGGATTT GATGCCATTA GAGTATATAA TAAGAGGCTG AAAGCGCTGA  1980
GGAAAATACA GAAACTAATA AAAAGTGGAC AATTAAGAGC AACAAAGAAT GGCATCATAA  2040
GTGATGCTGT TTCAACAAAT AATGCTTTTG AGCCTGATGA GGATATTGAA GATCTGGAGG  2100
AACTTGATAT CCCAACCAAG GAAATAGAGA TTCAAGTGGA TTGGAACTCT GAGCTTCCAG  2160
TCAAAGTGAA CGTTCCCAAA GTGCCAATCC ATAGCCTTGT GCTTGACTGT GGAGCTATAT  2220
CTTTCCTGGA CGTTGTTGGA GTGAGATCAC TGCGGGTGAT TGTCAAAGAA TTCCAAAGAA  2280
TTGATGTGAA TGTGTATTTT GCATCACTTC AAGATTATGT GATAGAAAAG CTGGAGCAAT  2340
GCGGGTTCTT TGACGACAAC ATTAGAAAGG ACACATTCTT TTTGACGGTC CATGATGCTA  2400
TACTCTATCT ACAGAACCAA GTGAAATCTC AAGAGGGTCA AGGTTCCATT TTAGAAACGA  2460
TCACTCTCAT TCAGGATTGT AAAGATACCC TTGAATTAAT AGAAACAGAG CTGACGGAAG  2520
AAGAACTTGA TGTCCAGGAT GAGGCTATGC GTACACTTGC ATCCTGAAAG TGGGTTCGGG  2580
AGGTCTCTAT GAGCAAGGAA TACAAGACAA AACTTCCTCA ATGCATTGAC TATTTCTTCA  2640
GACTCAAAAC ACTCATTCTT TTTTCTATTA AGCCATTGAA AGAGAAGCAC TAAGACTGCT  2700
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TCACAGATTT GCTAATAATG TTCACGTGGG CCCTGGCATA TCTCTGTTCA GTTAGAGTGA  2880
GTGCTGACCC AACAGCCTCT GTGGTCAAGC GAGTCACGAA TGATTAATCA TAAAGAAAAA  2940
TCAGTTTTTG ACTGACCTGG ATATCCATGA GCTGCACTGA TCACCATGTA AGGTCACATT  3000
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GTGCTATTCT GAGTGAAAAT TTTTTTGATG TGCTTACATA ACCATGGTGA TTAAAATGAG  3480
TTTATATTTT TTCTCAAAAA TTTTAGCAGT GTGTAAAGTA AGTAATCTTT AACTGAACTC  3540
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TTTTTCCTAA GTGCCAACAA TTTTCTAGAT ATTATATACA ACACAGGCTT TGATCTTGGG  3780
GACTTTTCCC ATATATTTCA CACTGGAGTG AATGAAGTTG TACTTCATTT CTAGAGAAAA  3840
GTTATACCCA GGTCCCCAAT TGAGAATGTC TTGCTTGATT GAAAACGACA TCATCCCTTG  3900
GTATACTCCA GGGATTGGTT TCAGGACCCC TGCATTTACC AAAATTTGTG CACACTCAAG  3960
TCCTGCAGTC ACCCCTGCCT AAAGATAGAA TGGCTTCTCT GTTTTTCTTC TGAAATACAA  4020
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CCTGAATTCT GGTTGTAAAT CTGGTTACAG CATAACTAGG ATTATAATGC TGCCTCATTT  4140
TCACAGCACT ACTTGCTTAT ATTGACAACA AATCATCTCG CTAAAGAGTG AATGTAGGCC  4200
AGGCGCGGTG GCTCATGCCT GTAATCCCAG CACTTTGGGA GGCCGAGGCG GGTGGATCAC  4260
GAGGTCAGGA GATCGAGACC ATCCTGGCTA ACATGGTAAA ACCCCGTCTC TACTAAAAAT  4320
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GGAGGCTAAG GCAGGAGAAT GGCGTGAACC CGGGAGGCGG AGCTTGCAGT GAGCCGAGGT  4440
CGTGCCACTG CACTCCAGCC TGGGCGACAG AGCAAGACTC CGTCTCAAAA AAAAAAAAAA  4500
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AAAAAAAAAA AGAGTGAATG TAATAGTCTT GCAGAAAATG AATGAATACC TTTGTTCAAT 4560
AAAGGAAATA TGCACTGCTC ACTTTTTTGA AGGAAATGCC AAAGTTACGT TTTACAACAA 4620
GGCTAGAGTT TGTAAATTCT GGGTTCATTT GTGATGACAT AAGTCAGCAA ACTGCGGGAA 4680
TACTGTCTCT TCTATGTATT TTGTGAATAG TAAGCATAAT TTTAGTTTTG TATTATCAAT 4740
GAAAATTTCA CTTGAAATTA AAGCTGCCTT TTGTTATATT TTTAACCTAT AGGATAAGAT 4800
TCCAGTATTG TATATGAGTT TTAACAAATT AAAAAATCAA ATCATGTACA TTTGAAAATA 4860
TTTGCACACA TTTAAAAATA AATGTAAAGT TGTCTTTTAA ACTACTCGGA TGTGTCCTTT 4920
CTGAACAAAA

SEQ ID NO:232 PFD4 Protein sequence:
Protein Accession #: O43511

1 11 21 31 41 51
MAAPGGRSEP PQLPEYSCSY MVSRPVYSEL AFQQQHERRL QERKTLRESL AKCCSCSRKR 60
AFGVLKTLVP ILEWLPKYRV KEWLLSDVIS GVSTGLVATL QGMAYALLAA VPVGYGLYSA 120
FFPILTYFIF GTSRHISVGP FPVVSLMVGS VVLSMAPDEH FLVSSSNGTV LNTTMIDTAA 180
RDTARVLIAS ALTLLVGIIQ LIFGGLQIGF IVRYLADPLV GGFTTAAAFQ VLVSQLKIVL 240
NVSTKNYNGV LSIIYTLVEI FQNIGDTNLA DFTAGLLTIV VCMAVKELND RFRHKIPVPI 300
PIEVIVTIIA TAISYGANLE KNYNAGIVKS IPRGFLPPEL PPVSLFSEML AASFSIAVVA 360
YAIAVSVGKV YATKYDYTID GNQEFIAFGI SNIFSGFFSC FVATTALSRT AVQESTGGKT 420
QVAGIISAAI VMIAILALGK LLEPLQKSVL AAVVIANLKG MFMQLCDIPR LWRQNKIDAV 480
IWVFTCIVSI ILGLDLGLLA GLIFGLLTVV LRVQFPSWNG LGSIPSTDIY KSTKNYKNIE 540
EPQGVKILRF SSPIFYGNVD GFKKCIKSTV GFDAIRVYNK RLKALRKIQK LIKSGQLRAT 600
KNGIISDAVS TNNAFEPDED IEDLEELDIP TKEIEIQVDW NSELPVKVNV PKVPIHSLVL 660
DCGAISFLDV VGVRSLRVIV KEFQRIDVNV YFASLQDYVI EKLEQCGFFD DNIRKDTFFL 720
TVHDAILYLQ NQVKSQEGQG SILETITLIQ DCKDTLELIE TELTEEELDV QDEAMRTLAS 780
QDEAMRTLAS

SEQ ID NO:233 PFH2 DNA SEQUENCE:
Nucleic Acid Accession #: NM_016029
Coding sequence: 228-1097 (underlined sequences correspond to start and stop codons)

1 11 21 31 41 51
CTGCGATCCC GCAGGGCAGC GACGCGACTC TGGTGCGGGC CGTCTTCTTC CCCCCGAGCT 60
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TGCTCCTGCT CTTGGTGCAG CTGCTGCGCT TCCTGAGGGC TGACGGCGAC CTGACGCTAC 180
TATGGGCCGA GTGGCAGGGA CGACGCCCAG AATGGGAGCT GACTGATATG GTGGTGTGGG 240
TGACTGGAGC CTCGAGTGGA ATTGGTGAGG AGCTGGCTTA CCAGTTGTCT AAACTAGGAG 300
TTTCTCTTGT GCTGTCAGCC AGAAGAGTGC ATGAGCTGGA AAGGGTGAAA AGAAGATGCC 360
TAGAGAATGG CAATTTAAAA GAAAAAGATA TACTTGTTTT GCCCCTTGAC CTGACCGACA 420
CTGGTTCCCA TGAAGCGGCT ACCAAAGCTG TTCTCCAGGA GTTTGGTAGA ATCGACATTC 480
TGGTCAACAA TGGTGGAATG TCCCAGCGTT CTCTGTGCAT GGATACCAGC TTGGATGTCT 540
ACAGAAAGCT AATAGAGCTT AACTACTTAG GGACGGTGTC CTTGACAAAA TGTGTTCTGC 600
CTCACATGAT CGAGAGGAAG CAAGGAAAGA TTGTTACTGT GAATAGCATC CTGGGTATCA 660
TATCTGTACC TCTTTCCATT GGATACTGTG CTAGCAAGCA TGCTCTCCGG GGTTTTTTTA 720
ATGGCCTTCG AACAGAACTT GCCACATACC CAGGTATAAT AGTTTCTAAC ATTTGCCCAG 780
GACCTGTGCA ATCAAATATT GTGGAGAATT CCCTAGCTGG AGAAGTCACA AAGACTATAG 840
GCAATAATGG AGACCAGTCC CACAAGATGA CAACCAGTCG TTGTGTGCGG CTGATGTTAA 900
TCAGCATGGC CAATGATTTG AAAGAAGTTT GGATCTCAGA ACAACCTTTC TTGTTAGTAA 960
CATATTTGTG GCAATACATG CCAACCTGGG CCTGGTGGAT AACCAACAAG ATGGGGAAGA 1020
AAAGGATTGA GAACTTTAAG AGTGGTGTGG ATGCAGACTC TTCTTATTTT AAAATCTTTA 1080
AGACAAAACA TGACTGAAAA GAGCACCTGT ACTTTTCAAG CCACTGGAGG GAGAAATGGA 1140
AAACATGAAA ACAGCAATCT TCTTATGCTT CTGAATAATC AAAGACTAAT TTGTGATTTT 1200
ACTTTTTAAT AGATATGACT TTGCTTCCAA CATGGAATGA AATAAAAAAT AAATAATAAA 1260
AGATTGCCAT GAATCTTGCA AA

SEQ ID NO:234 PFH2 Protein sequence:
Protein Accession #: NP_057113

1 11 21 31 41 51
MNWELLLWLL VLCALLLLLV QLLRFLRADG DLTLLWAEWQ GRRPEWELTD MVVWVTGASS 60
GIGEELAYQL SKLGVSLVLS ARRVHELERV KRRCLENGNL KEKDILVLPL DLTDTGSHEA 120
ATKAVLQEFG RIDILVNNGG MSQRSLCMDT SLDVYRKLIE LNYLGTVSLT KCVLPHMIER 180
KQGKIVTVNS ILGIISVPLS IGYCASKHAL RGFFNGLRTE LATYPGIIVS NICPGPVQSN 240
IVENSLAGEV TKTIGNNGDQ SHKMTTSRCV RLMLISMAND LKEVWISEQP FLLVTYLWQY 300
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SEQ ID NO:235 ACC5 DNA SEQUENCE
Nucleic Acid Accession #: NM_000450

Coding sequence: 1-1833 (underlined sequences correspond to start and stop codons)

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GCCTGGTCTT ACAACACCTC CACGGAAGCT ATGACTTATG ATGAGGCCAG TGCTTATTGT   120
CAGCAAAGGT ACACACACCT GGTTGCAATT CAAAACAAAG AAGAGATTGA GTACCTAAAC   180
TCCATATTGA GCTATTCACC AAGTTATTAC TGGATTGGAA TCAGAAAAGT CAACAATGTG   240
TGGGTCTGGG TAGGAACCCA GAAACCTCTG ACAGAAGAAG CCAAGAACTG GGCTCCAGGT   300
GAACCCAACA ATAGGCAAAA AGATGAGGAC TGCGTGGAGA TCTACATCAA GAGAGAAAAA   360
GATGTGGGCA TGTGGAATGA TGAGAGGTGC AGCAAGAAGA AGCTTGCCCT ATGCTACACA   420
GCTGCCTGTA CCAATACATC CTGCAGTGGC CACGGTGAAT GTGTAGAGAC CATCAATAAT   480
TACACTTGCA AGTGTGACCC TGGCTTCAGT GGACTCAAGT GTGAGCAAAT TGTGAACTGT   540
ACAGCCCTGG AATCCCCTGA GCATGGAAGC CTGGTTTGCA GTCACCCACT GGGAAACTTC   600
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ACCATGCAGT GTATGTCCTC TGGAGAATGG AGTGCTCCTA TTCCAGCCTG CAATGTGGTT   720
GAGTGTGATG CTGTGACAAA TCCAGCCAAT GGGTTCGTGG AATGTTTCCA AAACCCTGGA   780
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GCCCAGAGCC TTCAGTGTAC CTCATCTGGG AATTGGGACA ACGAGAAGCC AACGTGTAAA   900
GCTGTGACAT GCAGGGCCGT CCGCCAGCCT CAGAATGGCT CTGTGAGGTG CAGCCATTCC   960
CCTGCTGGAG AGTTCACCTT CAAATCATCC TGCAACTTCA CCTGTGAGGA AGGCTTCATG  1020
TTGCAGGGAC CAGCCCAGGT TGAATGCACC ACTCAAGGGC AGTGGACACA GCAAATCCCA  1080
GTTTGTGAAG CTTTCCAGTG CACAGCCTTG TCCAACCCCG AGCGAGGCTA CATGAATTGT  1140
CTTCCTAGTG CTTCTGGCAG TTTCCGTTAT GGGTCCAGCT GTGAGTTCTC CTGTGAGCAG  1200
GGTTTTGTGT TGAAGGGATC CAAAAGGCTC CAATGTGGCC CCACAGGGGA GTGGGACAAC  1260
GAGAAGCCCA CATGTGAAGC TGTGAGATGC GATGCTGTCC ACCAGCCCCC GAAGGGTTTG  1320
GTGAGGTGTG CTCATTCCCC TATTGGAGAA TTCACCTACA AGTCCTCTTG TGCCTTCAGC  1380
TGTGAGGAGG GATTTGAATT ATATGGATCA ACTCAACTTG AGTGCACATC TCAGGGACAA  1440
TGGACAGAAG AGGTTCCTTC CTGCCAAGTG GTAAAATGTT CAAGCCTGGC AGTTCCGGGA  1500
AAGATCAACA TGAGCTGCAG TGGGGAGCCC GTGTTTGGCA CTGTGTGCAA GTTCGCCTGT  1560
CCTGAAGGAT GGACGCTCAA TGGCTCTGCA GCTCGGACAT GTGGAGCCAC AGGACACTGG  1620
TCTGGCCTGC TACCTACCTG TGAAGCTCCC ACTGAGTCCA ACATTCCCTT GGTAGCTGGA  1680
CTTTCTGCTG CTGGACTCTC CCTCCTGACA TTAGCACCAT TTCTCCTCTG GCTTCGGAAA  1740
TGCTTACGGA AAGCAAAGAA ATTTGTTCCT GCCAGCAGCT GCCAAAGCCT TGAATCAGAC  1800
GGAAGCTACC AAAAGCCTTC TTACATCCTT TAA
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SEQ ID NO:236 ACC5 Protein sequence:

Protein Accession #: NP_000441

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SILSYSPSYY WIGIRKVNNV WVWVGTQKPL TEEAKNWAPG EPNNRQKDED CVEIYIKREK   120
DVGMWNDERC SKKKLALCYT AACTNTSCSG HGECVETINN YTCKCDPGFS GLKCEQIVNC   180
TALESPEHGS LVCSHPLGNF SYNSSCSISC DRGYLPSSME TMQCMSSGEW SAPIPACNVV   240
ECDAVTNPAN GFVECFQNPG SFPWNTTCTF DCEEGFELMG AQSLQCTSSG NWDNEKPTCK   300
AVTCRAVRQP QNGSVRCSHS PAGEFTFKSS CNFTCEEGFM LQGPAQVECT TQGQWTQQIP   360
VCEAFQCTAL SNPERGYMNC LPSASGSFRY GSSCEFSCEQ GFVLKGSKRL QCGPTGEWDN   420
EKPTCEAVRC DAVHQPPKGL VRCAHSPIGE FTYKSSCAFS CEEGFELYGS TQLECTSQGQ   480
WTEEVPSCQV VKCSSLAVPG KINMSCSGEP VFGTVCKFAC PEGWTLNGSA ARTCGATGHW   540
SGLLPTCEAP TESNIPLVAG LSAAGLSLLT LAPFLLWLRK CLRKAKKFVP ASSCQSLESD   600
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SEQ ID NO:237 PM28 DNA SEQUENCE

Nucleic Acid Accession #: N51002

Coding sequence: 1-3793 (underlined sequences correspond to start and stop codons)

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GAAAGGGATC GTCTTCTAGA CACCCTTCGG GAGACCCAGG AAAGCCTCTC ACTTGCCCAG   180
CAAAGACTTC AGGATGTCAT CTATGACCGA GACTCACTCC AGAGACAGCT CAATTCAGCC   240
CTGCCACAGG ATATCGAATC CCTAACAGGA GGGCTGGCTG GTTCTAAGGG GGCTGATCCA   300
CCGGAATTTG CTGCACTGAC AAAAGAATTA AATGCCTGCA GGGAACAACT TCTAGAAAAG   360
GAAGAAGAAA TCTCTGAACT TAAAGCTGAA AGAAACAACA CAAGACTATT ACTGGAGCAT   420
TTGGAGTGCC TTGTGTCACG ACATGAAAGA TCACTAAGAA TGACGGTGGT AAAACGGCAA   480
GCCCAGTCTC CCTCAGGAGT ATCCAGTGAA GTTGAAGTTC TCAAGGCACT GAAATCTTTG   540
TTTGAGCACC ACAAGGCCTT GGATGAAAAG GTAAGGGAGC GACTGAGGGT TTCTTTAGAA   600
AGAGTCTCTG CACTGGAAGA AGAACTAGCT GCTGCTAATC AGGAGATTGT TGCCTTGCGT   660
GAACAAAATG TTCATATACA AAGAAAAATG GCATCAAGCG AGGGATCCAC AGAGTCAGAA   720
CATCTTGAAG GGATGGAACC TGGACAGAAA GTCCATGAGA AGCGTTTGTC CAATGGTTCT   780
ATAGACTCAA CCGATGAAAC TAGTCAAATA GTTGAACTAC AAGAATTGCT TGAAAAGCAA   840
AACTATGAAA TGGCCCAGAT GAAAGAACGT TTAGCAGCCC TTTCTTCCCG AGTGGGAGAG   900
GTGGAACAGG AAGCAGAGAC AGCAAGAAAG GATCTCATTA AAACAGAAGA AATGAACACC   960
AAGTATCAAA GGGACATTAG GGAGGCCATG GCACAAAAGG AAGATATGGA AGAAAGAATT  1020
ACAACCCTTG AAAAGCGTTA CCTCAGTGCT CAGAGAGAAT CTACCTCCAT ACATGACATG  1080
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AATGATAAAC TAGAAAATGA GTTAGCAAAT AAAGAAGCTA TCCTACGGCA GATGGAAGAG 1140
AAAAACAGAC AGTTACAAGA ACGTCTTGAG CTAGCTGAAC AAAAGTTGCA GCAGACCATG 1200
AGAAAGGCTG AAACCTTGCC TGAAGTAGAG GCTGAACTGG CTCAGAGAAT TGCAGCCCTA 1260
ACCAAGGCTG AAGAGAGACA TGGAAATATT GAAGAACGTA TGAGACATTT AGAGGGTCAA 1320
CTTGAAGAGA AGAATCAAGA ACTTCAAAGA GCTAGGCAAA GAGAGAAAAT GAATGAGGAG 1380
CATAACAAGA GATTATCGGA TACGGTTGAT AGACTTCTGA CTGAATCCAA TGAACGCCTA 1440
CAACTACACT TAAAGGAAAG AATGGCTGCT CTAGAAGAAA AGAATGTTTT AATTCAAGAA 1500
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GGCCGCATGG GTGTGCGAAG AGATGAGCCA AAGGTGAAAT CTCTTGGGGA TCACGAGTGG 1800
AATAGAACTC AACAGATTGG AGTACTAAGC AGCCACCCTT TTGAAAGTGA CACTGAAATG 1860
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GGTACCTCCA TTACTGCCTC TGTTACAGCT TCATCGCTGG CCAGTTCATC TCCCCCCAGT 2160
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GAAGGAAGCT GGGCCCAGTG TCCGGTTTTT CTACAGACCC TGGCTTATGG AGATATGAAT 3060
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TTTATGGAAT GCTTGGTAGA TGCAAGAATG TTAGATCACC TAACAAAAAA AGATCTCCGT 3180
GTCCATTTAA AAATGGTGGA TAGTTTCCAT CGAACAAGTT TACAATATGG AATTATGTGC 3240
TTAAAGAGGT TGAATTATGA CAGAAAAGAA CTAGAAAGAA GACGGGAAGC AAGCCAACAT 3300
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GGACTTCGAG AATATGCAAA TAATATACTT GAGAGCGGTG TGCATGGCTC ACTTATAGCC 3420
CTGGATGAAA ACTTTGACTA CAGCAGCTTA ACTTTATTAT TACAGATTCC AACACAGAAC 3480
ACCCAGGCAA GGCAGATTCT TGAAAGAGAA TACAATAACC TCTTGGCCCT GGGAACTGAA 3540
AGGCGACTGG ATGAAAGTGA TGACAAGAAC TTCAGACGTG GATCAACCTG GAGAAGGCAG 3600
TTTCCTCCTC GTGAAGTACA TGGAATCAGC ATGATGCCTG GGTCCTCAGA AACATTACCA 3660
GCTGGATTTA GGTTAACCAC AACCTCTGGG CAATCAAGAA AAATGACAAC AGATGTTGCT 3720
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SEQ ID NO:238 PM28 Protein sequence:

Protein Accession #: none found

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EEEISELKAE RNNTRLLLEH LECLVSRHER SLRMTVVKRQ AQSPSGVSSE VEVLKALKSL  180
FEHHKALDEK VRERLRVSLE RVSALEEELA AANQEIVALR EQNVHIQRKM ASSEGSTESE  240
HLEGMEPGQK VHEKRLSNGS IDSTDETSQI VELQELLEKQ NYEMAQMKER LAALSSRVGE  300
VEQEAETARK DLIKTEEMNT KYQRDIREAM AQKEDMEERI TTLEKRYLSA QRESTSIHDM  360
NDKLENELAN KEAILRQMEE KNRQLQERLE LAEQKLQQTM RKAETLPEVE AELAQRIAAL  420
TKAEERHGNI EERMRHLEGQ LEEKNQELQR ARQREKMNEE HNKRLSDTVD RLLTESNERL  480
QLHLKERMAA LEEKNVLIQE SETFRKNLEE SLHDKERLAE EIEKLRSELD QLKMRTGSLI  540
EPTIPRTHLD TSAELRYSVG SLVDSQSDYR TTKVIRRPRR GRMGVRRDEP KVKSLGDHEW  600
NRTQQIGVLS SHPFESDTEM SDIDDDDRET IFSSMDLLSP SGHSDAQTLA MMLQEQLDAI  660
NKEIRLIQEE KESTELRAEE IENRVASVSL EGLNLARVHP GTSITASVTA SSLASSSPPS  720
GHSTPKLTPR SPAREMDRMG VMTLPSDLRK HRRKIAVVEE DGREDKATIK CETSPPPTPR  780
ALRMTHTLPS SYHNDARSSL SVSLEPESLG LGSANSSQDS LHKAPKKKGI KSSIGRLFGK  840
KEKARLGQLR GFMETEAAAQ ESLGLGKLGT QAEKDRRLKK KHELLEEARR KGLPFAQWDG  900
PTVVAWLELW LGMPAWYVAA CRANVKSGAI MSALSDTEIQ REIGISNPLH RLKLRLAIQE  960
MVSLTSPSAP PTSRTPSGNV WVTHEEMENL AAPAKTKESE EGSWAQCPVF LQTLAYGDMN 1020
HEWIGNEWLP SLGLPQYRSY FMECLVDARM LDHLTKKDLR VHLKMVDSFH RTSLQYGIMC 1080
LKRLNYDRKE LERRREASQH EIKDVLVWSN DRIIRWIQAI GLREYANNIL ESGVHGSLIA 1140
LDENFDYSSL TLLLQIPTQN TQARQILERE YNNLLALGTE RRLDESDDKN FRRGSTWRRQ 1200
PPPREVHGIS MMPGSSETLP AGFRLTTTSG QSRKMTTDVA SSRLQRLDNS TVRTYSCLE
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SEQ ID NO:239 PCI4 DNA SEQUENCE

Nucleic Acid Accession #: NM_016570

Coding sequence: 1- 1134 (underlined sequences correspond to start and stop codons)

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1          11         21         31         41         51
|          |          |          |          |          |
ATGAGGCGAC TGAATCGGAA AAAAACTTTA AGTTTGGTAA AAGAGTTGGA TGCCTTTCCG     60
AAGGTTCCTG AGAGCTATGT AGAGACTTCA GCCAGTGGAG GTACAGTTTC TCTAATAGCA    120
TTTACAACTA TGGCTTTATT AACCATAATG GAATTCTCAG TATATCAAGA TACATGGATG    180
AAGTATGAAT ACGAAGTAGA CAAGGATTTT TCTAGCAAAT TAAGAATTAA TATAGATATT    240
ACTGTTGCCA TGAAGTGTCA ATATGTTGGA GCGGATGTAT TGGATTTAGC AGAAACAATG    300
GTTGCATCTG CAGATGGTTT AGTTTATGAA CCAACAGTAT TTGATCTTTC ACCACAGCAG    360
AAAGAGTGGC AGAGGATGCT GCAGCTGATT CAGAGTAGGC TACAAGAAGA GCATTCACTT    420
CAAGATGTGA TATTTAAAAG TGCTTTTAAA AGTACATCAA CAGCTCTTCC ACCAAGAGAA    480
GATGATTCAT CACAGTCTCC AAATGCATGC AGAATTCATG GCCATCTATA TGTCAATAAA    540
GTAGCAGGGA ATTTTCACAT AACAGTGGGC AAGGCAATTC CACATCCTCG TGGTCATGCA    600
CATTTGGCAG CACTTGTCAA CCATGAATCT TACAATTTTT CTCATAGAAT AGATCATTTG    660
TCTTTTGGAG AGCTTGTTCC AGCAATTATT AATCCTTTAG ATGGAACTGA AAAAATTGCT    720
ATAGATCACA ACCAGATGTT CCAATATTTT ATTACAGTTG TGCCAACAAA ACTACATACA    780
TATAAAATAT CAGCAGACAC CCATCAGTTT TCTGTGACAG AAAGGGAACG TATCATTAAC    840
CATGCTGCAG GCAGCCATGG AGTCTCTGGG ATATTTATGA AATATGATCT CAGTTCTCTT    900
ATGGTGACAG TTACTGAGGA GCACATGCCA TTCTGGCAGT TTTTTGTAAG ACTCTGTGGT    960
ATTGTTGGAG GAATCTTTTC AACAACAGGC ATGTTACATG GAATTGGAAA ATTTATAGTT   1020
GAAATAATTT GCTGTCGTTT CAGACTTGGA TCCTATAAAC CTGTCAATTC TGTTCCTTTT   1080
GAGGATGGCC ACACAGACAA CCACTTACCT CTTTTAGAAA ATAATACACA TTGA
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SEQ ID NO:240 PCI4 Protein sequence:
Protein Accession #: NP_057654

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1          11         21         31         41         51
|          |          |          |          |          |
MRRLNRKKTL SLVKELDAPP KVPESYVETS ASGGTVSLIA FTTMALLTIM EFSVYQDTWM     60
KYEYEVDKDF SSKLRINIDI TVAMKCQYVG ADVLDLAETM VASADGLVYE PTVFDLSPQQ    120
KEWQRMLQLI QSRLQEEHSL QDVIFKSAFK STSTALPPRE DDSSQSPNAC RIHGHLYVNK    180
VAGNFHITVG KAIPHPRGHA HLAALVNHES YNFSHRIDHL SFGELVPAII NPLDGTEKIA    240
IDHNQMFQYF ITVVPTKLHT YKISADTHQF SVTERERIIN HAAGSHGVSG IFMKYDLSSL    300
MVTVTEEHMP FWQFFVRLCG IVGGIFSTTG MLHGIGKFIV EIICCRFRLG SYKPVNSVPF    360
EDGHTDNHLP LLENNTH
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SEQ ID NO:241 PBA7 DNA SEQUENCE

Nucleic Acid Accession#: AA219134

Coding sequence: 24-1815 (underlined sequences correspond to start and stop codons)

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AATTCGCCCT TGCTTAATTA AGCATGTTTA CCTTCCTGTC ATCTGTCACT GCTGCTGTCA   60
GTGGCCTCCT GGTGGGTTAT GAACTTGGGA TCATCTCTGG GGCTCTTCTT CAGATCAAAA   120
CCTTATTAGC CCTGAGCTGC CATGAGCAGG AAATGGTTGT GAGCTCCCTC GTCATTGGAG   180
CCCTCCTTGC CTCACTCACC GGAGGGGTCC TGATAGACAG ATATGGAAGA AGGACAGCAA   240
TCATCTTGTC ATCCTGCCTG CTTGGACTCG GAAGCTTAGT CTTGATCCTC AGTTTATCCT   300
ACACGGTTCT TATAGTGGGA CGCATTGCCA TAGGGGTTTC CATCTCCCTC TCTTCCATTG   360
CCACTTGTGT TTACATCGCA GAGATTGCTC CTCAACACAG AAGAGGCCTT CTTGTGTCAC   420
TGAATGAGCT GATGATTGTC ATCGGCATTC TTTCTGCCTA TATTTCAAAT TACGCATTTG   480
CCAATGTTTT CCATGGCTGG AAGTACATGT TTGGTCTTGT GATTCCCTTG GGAGTTTTGC   540
AAGCAATTGC AATGTATTTT CTTCCTCCAA GCCCTCGGTT TCTGGTGATG AAAGGACAAG   600
AGGGAGCTGC TAGCAAGGTT CTTGGAAGGT TAAGAGCACT CTCAGATACA ACTGAGGAAC   660
TCACTGTGAT CAAATCCTCC CTGAAAGATG AATATCAGTA CAGTTTTTGG GATCTGTTTC   720
GTTCAAAAGA CAACATGCGG ACCCGAATAA TGATAGGACT AACACTAGTA TTTTTTGTAC   780
AAATCACTGG CCAACCAAAC ATATTGTTCT ATGCATCAAC TGTTTTGAAG TCAGTTGGAT   840
TTCAAAGCAA TGAGGCAGCT AGCCTCGCCT CCACTGGGGT TGGAGTCGTC AAGGTCATTA   900
GCACCATCCC TGCCACTCTT CTTGTAGACC ATGTCGGCAG CAAAACATTC CTCTGCATTG   960
GCTCCTCTGT GATGGCAGCT TCGTTGGTGA CCATGGGCAT CGTAAATCTC AACATCCACA  1020
TGAACTTCAC CCATATCTGC AGAAGCCACA ATTCTATCAA CCAGTCCTTG GATGAGTCTG  1080
TGATTTATGG ACCAGGAAAC CTGTCAACCA ACAACAATAC TCTCAGAGAC CACTTCAAAG  1140
GGATTTCTTC CCATAGCAGA AGCTCACTCA TGCCCCTGAG AAATGATGTG GATAAGAGAG  1200
GGGAGACGAC CTCAGCATCC TTGCTAAATG CTGGATTAAG CCACACTGAA TACCAGATAG  1260
TCACAGACCC TGGGGACGTC CCAGCTTTTT TGAAATGGCT GTCCTTAGCC AGCTTGCTTG  1320
TTTATGTTGC TGCTTTTTCA ATTGGTCTAG GACCAATGCC CTGGCTGGTG CTCAGCGAGA  1380
TCTTTCCTGG TGGGATCAGA GGACGAGCCA TGGCTTTAAC TTCTAGCATG AACTGGGGCA  1440
TCAATCTCCT CATCTCGCTG ACATTTTTGA CTGTAACTGA TCTTATTGGC CTGCCATGGG  1500
TGTGCTTTAT ATATACAATC ATGAGTCTAG ATCTTATTGG CCTGCCATGG GTGTGCTTTA  1560
TATATACAAT CATGAGTCTA GCATCCCTGC TTTTTGTTGT TATGTTTATA CCTGAGACAA  1620
AGGGATGCTC TTTGGAACAA ATATCAATGG AGCTAGCAAA AGTGAACTAT GTGAAAAACA  1680
ACATTTGTTT TATGAGTCAT CACCAAGAAG AATTAGTGCC AAAACAGCCT CAAAAAAGAA  1740
AACCCCAGGA GCAGCTCTTG GAGTGTAACA AGCTGTGTGG TAGGGGCCAA TCCAGGCAGC  1800
TTTCTCCAGA GACCTAATGG CCTCAACACC TTCTGAACGT GGATAGTGCC AGAACACTTA  1860
GGAGGGTGTC TTTGGACCAA TGCATAGTTG CGACTCCTGT GCTCTCTTTT CAGTGTCATG  1920
GAACTGGTTT TGAAGAGACA CTCTGAAATG ATAAAGACAG CCTTTAATCC CCCTCCTCMC  1980
CAGAAGGAAC CTCAAAAGGT AGATGAGGTA CAAGGTCCTA AGTGATCTCT TTTTCTGAGC  2040
AGGATATCAG GTTAAAAAAA AAAAGTTACT GGCTGGTTTA ATACTTTCTA CCTTCTTCAC  2100
AGAGCAGCCT TTGAATAGAC TATGTCCTAG TGAAGACATC AACCTCCGCC TTAAGCTATG  2160
TATGTATGGA GGCCAGTCGC AGCTTTATTA TGCAGACACA CAAGTGGTCT GGACATGAGG  2220
GTACAGTTTC TGCCTACCAA GACACTACTT GCACTGGATC TTACGCAAAA AAGAACCAGA  2280
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ACACACAGTG TGGACAACTG CCCATATATT CTATCTAGAT TAGGAGAGGG TCCTGGCTAG 2340
GATTTTAGTG GTAATTCCTA GTTACATTCA ACAAGTATAA AGATTATAGA GCTTATTTTA 2400
TGAACTATAA ACTATAATTT AATGCAAAAT ATCCTTTTAT GAATTTCATG TTAATATTGT 2460
GAAATATTAA AATAATTCCR CAATAGTTGA GAAAAATGAG CATTTTTTTC CATTTTTAAA 2520
AAATGCATAG AAAAGACAAT TTTAAAATCC TGGGACCATA TTTATTTAGA AGTAGCTGTT 2580
AGTAAAACAT TAGAAAAGGA GTCAGGCCAT TAGGTTATTT ATCCAAATCT CTAAGCAATT 2640
AGGTTGAAGT TATTAAGTCA AGCCTAGAAA AGCTGCCTCC TTGTAAGGCT TTCATGACAA 2700
TGTATAGTAA TCCACAGTGT CCAATTCTTC ACACTCCTCA GGAATATCAC TACCTCAGGT 2760
TACGGTACAC AGGCTATAAT TGATGATGAT GTTCAGATAA CTGAAGACAC AATAAATGAC 2820
ATTCAGACAT CAGGAMAAWW CCCTCATGTT CTTTTCTATG ATGGCCACCT GTACCAGCAA 2880
CGTGGGTTTC ACCCACACAA CGATGAACTG TTCTCTTACT TCTCCAGTTG ATTTTAAAGA 2940
CTTGTTAAGA GGTCTTACTA ATAAAATTTG GGTATGATAG AAAAWCCACA ATCAAAWCTT 3000
GAACCAAATA ACATATTAAA TTACTAATAT TTAAGTGATG GAAGACACAC AAAAAACTTA 3060
AAAGCACGAA CAACCTAACT TGAAAAAGAA TTTTAAAATA TGATTAACCT GAAGAAAAGA 3120
GAATCCTAAG AGCCAAAGCT CCTTTTTATT TAGCTTGGAA TTTTCCTATT GGTTCCTAAC 3180
AAACTGTCCC AATGTCATAT AAGGAAACAT GATCTATTAC ATTCCTTTAT AACAATGTGG 3240
AGAGACTATA AACCTATGTA AGTAGTAAAA CTATATYAGA GACTCAGGAG ACTGACTAAA 3300
AGGCCTGGAT CTGCAGTGTA TTATCTGTAT AAAAATTGGC AGGGGGAAGC TAAAAGGAAA 3360
GGAGATTGGA GATCTCAATT CTATCATGGT GTATTTCATA CGCAAATCAG AGCATGCATT 3420
GTTTTTTGTT TTTGGAAAGA GAAGGGAAGT GTGTTCTGCC CCATGTTTCC TTCCGTGTTT 3480
ATAGTTCAAA CTCTATATAT ACTTCAGGTA TTTTTTGTTT AGCCCTTCAT TATAAATGGG 3540
CAGGAAATTG TTTATCAACC TAGCCAGTTT ATTACTAGTG ACCTTGACTT CAGTATCTTG 3600
AGCATTCTTT TATATTTTTC TTTTATTATC CTGAGTCTGT AACTAAACAA TTTTGTCTTC 3660
AAATTTTTAT CCAATATCCA TTGCACCACA CCAAATCAAG CTTCTTGATT TTCAAAAATA 3720
AAAAGGGGGA AATACTTACA ACTTGTACAT ATATATTCAC AGTTTTTATT TATAAAAAAA 3780
ATTTACAGTA CTTATGGAGA GCCAGCAGAA GACATCAGAG CACTCACTTC TTCCCATCTT 3840
TGTTAAGGTT AGCGAATTAC CCATGGACAC TGTTAGGTGA GGCTCATTCG GCAGCCCTGA 3900
AAACAAACCT GGTCACACTG TCTTTACCCT CTCCCTTCAG ATAAAGCACT TCGATTATCT 3960
ATTGATCTGC CCAGTTTTCA AGTCATGCGA ATACTAAAAA GGTTACATCA TCTGGATCTG 4020
TACCTTGGCT ATATAAGCAT GTTTTCCCCC TATTCTATGT TTCTTTTTTT GGTGAACATT 4080
GAAAAACAGG AGGTGACTTA TTACTGTTAA TTAAAACTAA ATGAAAAATG TCAAGTCTTT 4140
AAAACAGTGA GCTTGTAACT CTTTCATGTA ATTTTATTCT CTATGAATTT GGCTATCCTA 4200
CTGAATCTTA AAATAAAGGA AATAAACACT TTTTTTTWAA AAAAAAGGAA AAATAMAARW 4260
MWAAAAATCT CAATGAAATA TTTCACAAGA AGGAAAAA

SEQ ID NO:242 PBA7 Protein sequence:

Protein Accession #: AAF91431

MFTFLSSVTA AVSGLLVGYE LGIISGALLQ IKTLLALSCH EQEMVVSSLV IGALLASLTG 60
GVLIDRYGRR TAIILSSCLL GLGSLVLILS LSYTVLIVGR IAIGVSISLS SIATCVYIAE 120
IAPQHRRGLL VSLNELMIVI GILSAYISNY AFANVFHGWK YMFGLVIPLG VLQAIAMYFL 180
PPSPRFLVMK GQEGAASKVL GRLRALSDTT EELTVIKSSL KDEYQYSFWD LFRSKDNMRT 240
RIMIGLTLVF FVQITGQPNI LFYASTVLKS VGFQSNEAAS LASTGVGVVK VISTIPATLL 300
VDHVGSKTFL CIGSSVMAAS LVTMGIVNLN IHMNFTHICR SHNSINQSLD ESVIYGPGNL 360
STNNNTLRDH FKGISSHSRS SLMPLRNDVD KRGETTSASL LNAGLSHTEY QIVTDPGDVP 420
AFLKWLSLAS LLVYVAAFSI GLGPMPWLVL SEIFPGGIRG RAMALTSSMN WGINLLISLT 480
FLTVTDLIGL PWVCFIYTIM SLDLIGLPWV CFIYTIMSLA SLLFVVMFIP ETKGCSLEQI 540
SMELAKVNYV KNNICFMSHH QEELVPKQPQ KRKPQEQLLE CNKLCGRGQS RQLSPET

SEQ ID NO:243 PAB4 DNA sequence:
Nucleic Acid Accession#: AA172056

Coding sequence: 121-339 (underlined sequences correspond to start and stop codons)

TTTAGCCACC AGAGGANTTC TCTTGAAATA CCCAAAATCC ATCAGTATCT TGAATCATGC 60
TGGATTTTGA AGAATTCTTA AGAAGCCATG TAAAGGGGGC TCTCTGGCCT TGAAATAGTG 120
ATGTTTTTTA TACAGAAAGG AGAATGCAGA ATGGTCAGAC TATCATGCAC TGTTAAATTT 180
GATTTCAAGA AATTACAGGA AAACTTTCCA AAGTTCCATC TCACAGAANN TTATTTTNCC 240
AAGAATTCCA AGATAAGTTT AGTTTTATGG AAGACTTTTA TGTGGTTTTT ACTCACTCTT 300
CATCTCAGAC ATCGACAGAT GATTACATCA CTTATAGTTC TAGTAAATTT ATTAATATAA 360
AACTCAGAGA CATTCCAATA TCCACATTGC TTACACCATT AGGCATAGAT TCAGTGTCAG 420
CTATGACAAT TGAAAATGAG CTGTTTTGTG ATTTAAAGGT TTAAATTTCT CTAACCAAAC 480
TGCTTGATCC AGATGCAGGA CTGCAAATGT TAATATTTGT TCTGGAAGAA CAATCAAATA 540
AGACTTAAGA GGAAAGGGAA TGGCCACAAT CCACCTGAAA TTTTTTCTTA AAAAGTGTGC 600
AGCCTACTAA ATCAGAATGA AAATAGAAGT ACAAGATTAT AAACAAAATG CAATCAAACT 660
TTTCTTAAGC TTACCTAAAG TTATTTCATC TGAAAATTTC AAGCAACTTT GTTCAACATT 720
AAATTGACAA TCTAAACTAA CAAGTCTTTT GAATTTATGC ATGGTAGTAA ACATTCTCTC 780
TATTAACTTT ATTACCTAAG GCTAAACCTA AAATTTTTAA GCAAAATTAG AAAAATAGTC 840
TTCACTCATC AAAAAATAAA GTTTGTTACA TTTAGTATTT TCCCAATAAA ATTGGTCGTT 900
CTTGGTTTTT TATTTGGAGA GTCTGTGCAA AATGTCACTA AAAATAAATT AGCACTAGAA 960
ATTATTTCTA AATACCAAA

SEQ ID NO:244 PBQ8 DNA SEQUENCE

Nucleic Acid Accession#: X51405
Coding sequence: 3-1721 (underlined sequence corresponds to start and stop codon)

1 11 21 31 41 51

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AAATGGCGTG CCCGTCTCTC CGCCGGCCCC CTGCCTCGCA GTGGTTTCTC CTGCAGCTCC   60
CCTGGGCTCC GCGGCCAGTA GTGCAGCCCG TGGAGCCGCG GCTTTGCCCG TCTCCTCTGG  120
GTGGCCCCAG TGCGCGGGCT GACACTCATT CAGCCGGGGA AGGTGAGGCG AGTAGAGGCT  180
GGTGCGGAAC TTGCCGCCCC CAGCAGCGCC GGCGGGCTAA GCCCAGGGCC GGGCAGACAA  240
AAGAGGCCGC CCGCGTAGGA AGGCACGGCC GGCGGCGGCG GAGCGCAGCG ATGGCCGGGC  300
GAGGGGGCAG CGCGCTGCTG GCTCTGTGCG GGGCACTGGC TGCCTGCGGG TGGCTCCTGG  360
GCGCCGAAGC CCAGGAGCCC GGGGCGCCCG CGGCGGGCAT GAGGCGGCGC CGGCGGCTGC  420
AGCAAGAGGA CGGCATCTCC TTCGAGTACC ACCGCTACCC CGAGCTGCGC GAGGCGCTCG  480
TGTCCGTGTG GCTGCAGTGC ACCGCCATCA GCAGGATTTA CACGGTGGGG CGCAGCTTCG  540
AGGGCCGGGA GCTCCTGGTC ATCGAGCTGT CCGACAACCC TGGCGTCCAT GAGCCTGGTG  600
AGCCTGAATT TAAATACATT GGGAATATGC ATGGGAATGA GGCTGTTGGA CGAGAACTGC  660
TCATTTTCTT GGCCCAGTAC CTATGCAACG AATACCAGAA GGGGAACGAG ACAATTGTCA  720
ACCTGATCCA CAGTACCCGC ATTCACATCA TGCCTTCCCT GAACCCAGAT GGCTTTGAGA  780
AGGCAGCGTC TCAGCCTGGT GAACTCAAGG ACTGGTTTGT GGGTCGAAGC AATGCCCAGG  840
GAATAGATCT GAACCGGAAC TTTCCAGACC TGGATAGGAT AGTGTACGTG AATGAGAAAG  900
AAGGTGGTCC AAATAATCAT CTGTTGAAAA ATATGAAGAA AATTGTGGAT CAAAACACAA  960
AGCTTGCTCC TGAGACCAAG GCTGTCATTC ATTGGATTAT GGATATTCCT TTTGTGCTTT 1020
CTGCCAATCT CCATGGAGGA GACCTTGTGG CCAATTATCC ATATGATGAG ACGCGGAGTG 1080
GTAGTGCTCA CGAATACAGC TCCTCCCCAG ATGACGCCAT TTTCCAAAGC TTGGCCCGGG 1140
CATACTCTTC TTTCAACCCG GCCATGTCTG ACCCCAATCG GCCACCATGT CGCAAGAATG 1200
ATGATGACAG CAGCTTTGTA GATGGAACCA CCAACGGTGG TGCTTGGTAC AGCGTACCTG 1260
GAGGGATGCA AGACTTCAAT TACCTTAGCA GCAACTGTTT TGAGATCACC GTGGAGCTTA 1320
GCTGTGAGAA GTTCCCACCT GAAGAGACTC TGAAGACCTA CTGGGAGGAT AACAAAAACT 1380
CCCTCATTAG CTACCTTGAG CAGATACACC GAGGAGTTAA AGGATTTGTC CGAGACCTTC 1440
AAGGTAACCC AATTGCGAAT GCCACCATCT CCGTGGAAGG AATAGACCAC GATGTTACAT 1500
CCGCAAAGGA TGGTGATTAC TGGAGATTGC TTATACCTGG AAACTATAAA CTTACAGCCT 1560
CAGCTCCAGG CTATCTGGCA ATAACAAAGA AAGTGGCAGT TCCTTACAGC CCTGCTGCTG 1620
GGGTTGATTT TGAACTGGAG TCATTTTCTG AAAGGAAAGA AGAGGAGAAG GAAGAATTGA 1680
TGGAATGGTG GAAAATGATG TCAGAAACTT TAAATTTTTA AAAAGGCTTC TAGTTAGCTG 1740
CTTTAAATCT ATCTATATAA TGTAGTATGA TGTAATGTGG TCTTTTTTTT AGATTTTGTG 1800
CAGTTAATAC TTAACATTGA TTTATTTTTT AATCATTTAA ATATTAATCA ACTTTCCTTA 1860
AAATAAATAG CCTCTTAGGT AAAAATATAA GAACTTGATA TATTTCATTC TCTTATATAG 1920
TATTCATTTT CCTACCTATA TTACACAAAA AAGTATAGAA AAGATTTAAG TAATTTTGCC 1980
ATCCTAGGCT TAAATGCAAT ATTCCTGGTA TTATTTACAA TGCAGAATTT TTTGAGTAAT 2040
TCTAGCTTTC AAAAATTAGT GAAGTTCTTT TACTGTAATT GGTGACAATG TCACATAATG 2100
AATGCTATTG AAAAGGTTAA CAGATACAGC TCGGAGTTGT GAGCACTCTA CTGCAAGACT 2160
TAAATAGTTC AGTATAAATT GTCGTTTTTT TCTTGTGCTG ACTAACTATA AGCATGATCT 2220
TGTTAATGCA TTTTTGATGG GAAGAAAAGG TACATGTTTA CAAAGAGGTT TTATGAAAAG 2280
AATAAAAATT GACTTCTTGC TTGTACATAT AGGAGCAATA CTATTATATT ATGTAGTCCG 2340
TTAACACTAC TTAAAAGTTT AGGGTTTTCT CTTGGTTGTA GAGTGGCCCA GAATTGCATT 2400
CTGAATGAAT AAAGGTTAAA AAAAAATCCC CAGTGAAAAA AAA
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SEQ ID NO:245 PBQ8 Protein sequence

Protein Accession#: P16870

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MAGRGGSALL ALCGALAACG WLLGAEAQEP GAPAAGMRRR RRLQQEDGIS FEYHRYPELR  60
EALVSVWLQC TAISRIYTVG RSFEGRELLV IELSDNPGVH EPGEPEFKYI GNMHGNEAVG 120
RELLIFLAQY LCNEYQKGNE TIVNLIHSTR IHIMPSLNPD GFEKAASQPG ELKDWFVGRS 180
NAQGIDLNRN FPDLDRIVYV NEKEGGPNNH LLKNMKKIVD QNTKLAPETK AVIHWIMDIP 240
FVLSANLHGG DLVANYPYDE TRSGSAHEYS SSPDDAIFQS LARAYSSFNP AMSDPNRPPC 300
RKNDDDSSFV DGTTNGGAWY SVPGGMQDFN YLSSNCFEIT VELSCEKFPP EETLKTYWED 360
NKNSLISYLE QIHRGVKGFV RDLQGNPIAN ATISVEGIDH DVTSAKDGDY WRLLIPGNYK 420
LTASAPGYLA ITKKVAVPYS PAAGVDFELE SFSERKEEEK EELMEWWKMM SETLNF
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SEQ ID NO:246 PBY4 DNA sequence

Nucleic Acid Accession#: AF038966

Coding sequence: 91-1107 (underlined sequence corresponds to start and stop codon)

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1          11         21         31         41         51         .
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GGGGCGACGT GAGCGCGCAG GGGGGCGGCG GCCTCGCCTC GTCTCTCTCT CTGCGCCTGG   60
GTCGGGTGGG TGACGCCGAG AGCCAGAGAG ATGTCGGATT TCGACAGTAA CCCGTTTGCC  120
GACCCGGATC TCAACAATCC CTTCAAGGAT CCATCAGTTA CACAAGTGAC AAGAAATGTT  180
CCACCAGGAC TTGATGAATA TAATCCATTC TCGGATTCTA GAACACCTCC ACCAGGCGGT  240
GTGAAGATGC CTAATGTACC CAATACACAA CCAGCAATAA TGAAACCAAC AGAGGAACAT  300
CCAGCTTATA CACAGATTGC AAAGGAACAT GCATTGGCCC AAGCTGAACT TCTTAAGCGC  360
CAAGAAGAAC TAGAAAGAAA AGCCGCAGAA TTAGATCGTC GGGAACGAGA AATGCAAAAC  420
CTCAGTCAAC ATGGTAGAAA AAATATTTGG CCACCTCTTC CTAGCAATTT TCCTGTCGGA  480
CCTTGTTTCT ATCAGGAATT TTCTGTAGAC ATTCCTGTAG AATTCCAAAA GACAGTAAAG  540
CTTATGTACT ACTTGTGGAT GTTCCATGCA GTAACACTGT TTCTAAATAT CTTCGGATGC  600
TTGGCTTGGT TTTGTGTTGA TTCTGCAAGA GCGGTTGATT TTGGATTGAG TATCCTGTGG  660
TTCTTGCTTT TTACTCCTTG TTCATTTGTC TGTTGGTACA GACCACTTTA TGGAGCTTTC  720
AGGAGTGACA GTTCATTTAG ATTCTTTGTA TTCTTCTTCG TCTATATTTG TCAGTTTGCT  780
GTACATGTAC TCCAAGCTGC AGGATTTCAT AACTGGGGCA ATTGTGGTTG GATTTCATCC  840
CTTACTGGTC TCAACCAAAA TATTCCTGTT GGAATCATGA TGATAATCAT AGCAGCACTT  900
TTCACAGCAT CAGCAGTCAT CTCACTAGTT ATGTTCAAAA AAGTACATGG ACTATATCGC  960
ACAACAGGTG CTAGTTTTGA GAAGGCCCAA CAGGAGTTTG CAACAGGTGT GATGTCCAAC 1020
AAAACTGTCC AGACCGCAGC TGCAAATGCA GCTTCAACTG CAGCATCTAG TGCAGCTCAG 1080
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AATGCTTTCA AGGGTAACCA GATTTAAGAA TCTTCAAACA ATACACTGTT ACCTTTTGAC 1140
TGTACCTTTT TCTCCAGTTA CTGTATTCTA CAAATATTTT TATGTTCAAA ACACACAGTA 1200
CAGACAGCAT GGATATTTCC TGTTCACTTG TGCATGGGCT AAAACCAGGA AAACTTCCTT 1260
GTCTTATTAC TTTACCTAAT AGTTTCTTAA TATTTCAGTG CCCCTTGCAG AAAAAATATT 1320
ACATGCTAAA TAAATATTCT CCATATTTTT GGGGGATGAC ATTCAGTGAA TTATTTCAGT 1380
GGTGACCCAC TGAAAATTAA TAATGGTACT TATGATTAAA AACGCATTTA ATACTAACTG 1440
CAGTAGTTCT TTCAAGAATC TTTAGAGATA AGGATTGCAC ATTGGAAAAG TAAACCATGT 1500
TTCATTCCTT TTTCCCTATT TATATTGAAA GAAATAGGCC AGCAGAGACT TAGGGATTTT 1560
AAATTGGCTT GCTTTTTAGC TGTTTCAGTC ACCAGTGAAG AGCCTATGTG CATTTTGTAG 1620
TAGATAATGT AAAATTTGTC ATCTTTTTCT TTTCTTTTTT TTAGAATAGC TGATATTTTG 1680
ATAACAATCT CTAATTTGCA TGGGCACCAC ATTTCTTATA TTAAAAGAAT TAGTGTTTTG 1740
GCTTCTGTAC TGCTTATGGT TGTAGGATTC AGGGGTTAAT GGAATCACAG AAATGATATT 1800
CTGCAAGAAT TTCTTTTAAA TAAAAAGTTT GGGGGTGCAA TATAAGAAGT TTATATAATA 1860
TGCAGTACAT TATCCAAAAG AGAAGGTAGT TAATGCAGTA GAAAGTAGTG GTAATAATTC 1920
CTTTTT

SEQ ID NO: 247 PBY4 Protein sequence:

Protein Accession #:

MSDFDSNPFA DPDLNNPFKD PSVTQVTRNV PPGLDEYNPF SDSRTPPPGG VKMPNVPNTQ 60
PAIMKPTEEH PAYTQIAKEH ALAQAELLKR QEELERKAAE LDRREREMQN LSQHGRKNIW 120
PPLPSNFPVG PCFYQEFSVD IPVEFQKTVK LMYYLWMFHA VTLFLNIFGC LAWFCVDSAR 180
AVDFGLSILW FLLFTPCSFV CWYRPLYGAF RSDSSFRFFV FFFVYICQFA VHVLQAAGFH 240
NWGNCGWISS LTGLNQNIPV GIMMIIIAAL FTASAVISLV MFKKVHGLYR TTGASFEKAQ 300
QEFATGVMSN KTVQTAAANA ASTAASSAAQ NAFKGNQI

SEQ ID NO:248 PBH2 DNA sequence
Nucleic Acid Accession#: none found
Coding sequence: 1-613 (underlined sequence corresponds to start and stop codon)

ATGAGAGACA ATAAATCGTG TGCTTTTTTC ATGGGAAAGT TAAATGTTTG TTTTGAAGGC 60
ACAGTAATAG CAGGCTATTC AGTGTTTGCC ACTACCTGCA TCATTCATCT GGCTGTAGCT 120
AGTGCACTAC AATTTCCTAA AAAGTCTTCT CACCCTCACA GGACTGCTCT ACATCTGGCC 180
TCTGCCAATG GAAATTCAGA AGTAGTAAAA CTCCTGCTGG ACAGACGATG TCAACTTAAT 240
ATCCTTGACA ACAAAAAGAG GACAGCTCTG ACAAAGGCCG TACAATGCCA GGAAGATGAA 300
TGTGCGTTAA TGTTGCTGGA ACATGGCACT GATCCGAATA TTCCAGATGA GTATGGAAAT 360
ACCGCTCTAC ACTATGCTAT CTACAATGAA GATAAATTAA TGGCCAAAGC ACTGCTCTTA 420
TACGGTGCTG ATATCGAATC AAAAAACAAG CATGGCCTCA CACCACTGTT ACTTGGTGTA 480
CATGAGCAAA AACAGCAAGT GGTGAAATTT TTAATCAAGA AAAAAGCAAA TTTAAATGCA 540
CTGGATAGAT ATGGAAGGTG TGTGACCTTG GGAACGTTAT TTACCACCAA ATATGTTGTC 600
ATATATGAAA AGTAG

SEQ ID NO:249 PBH2 Protein sequence:

Protein Accession #: none found

MRDNKSCAFF MGKLNVCFEG TVIAGYSVFA TTCIIHLAVA SALQFPKKSS HPHRTALHLA 60
SANGNSEVVK LLLDRRCQLN ILDNKKRTAL TKAVQCQEDE CALMLLEHGT DPNIPDEYGN 120
TALHYAIYNE DKLMAKALLL YGADIESKNK HGLTPLLLGV HEQKQQVVKF LIKKKANLNA 180
LDRYGRCVTL GTLFTTKYVV IYEK

SEQ ID NO:250 PBJ1 DNA sequence
Nucleic Acid Accession#: XM_005829
Coding sequence: 1-3043 (underlined sequence corresponds to start and stop codon)

ATGGTGATCA TCTATCTTTC TTTCTGCAAT TATTACATGG AGTTCTACAG AGAAGAGCTT 60
CCCCACATTG ACTATTTGAT TGACATTCAG TTTGCAACAG GAAAGGTTAC TCAGCCGGGA 120
GAGGACACTT CCTACCATCA ATGCGCTCAG CTTGAAGCCA GAGACGAAGG CACCGACAGT 180
TTATTATTAA ACAATGGCAG CAGCGCCACG CTGAAGACAC GAACGCGCTG TTATGGAACC 240
CCCAGAGGTC TCCCCCATCG TAGCCTGCTC CAGCCGACTC CGCCCACATG TAAAACGAAG 300
ATCAGGAGCA GATTTGAAGA ATTACAAAGT GAATTGGTGC CAGTCAGCAT GTCAGAGACA 360
GACCACATAG CCTCTACTTC CTCTGATAAA AATGTTGGGA AAACACCTGA ATTAAAGGAA 420
GACTCATGCA ACTTGTTTTC TGGCAATGAA AGCAGCAAAT TAGAAAATGA GTCCAAACTA 480
TTGTCATTAA ACACTGATAA AACTTTATGT CAACCTAATG AGCATAATAA TCGAATTGAA 540
GCCCAGGAAA ATTATATTCC AGATCATGGT GGAGGTGAGG ATTCTTGTGC CAAAACAGAC 600
ACAGGCTCAG AAAATTCTGA ACAAATAGCT AATTTTCCTA GTGGAAATTT TGCTAAACAT 660
ATTTCAAAAA CAATGAAAC AGAACAGAAA GTAACACAAA TATTGGTGGA ATTAAGGTCA 720
TCTACATTTC CAGAATCAGC TAATGAAAAG ACTTATTCAG AAAGCCCCTA TGATACAGAC 780
TGCACCAAGA AATTTATTTC AAAAATAAAG AGCGTTTCAG CATCAGAGGA TTTGTTGGAA 840
GAAATAGAAT CTGAGCTCTT ATCTACGGAG TTTGCAGAAC ATCGAGTACC AAATGGAATG 900
AATAAGGGAG AACATGCATT AGTTCTGTTT GAAAAGTGTG TGCAAGATAA ATATTTGCAG 960
CAGGAACATA TCATAAAAAA GTTAATTAAA GAAAATAAGA AGCATCAGGA GCTCTTCGTA 1020
GACATTTGTT CAGAAAAAGA CAATTTAAGA GAAGAACTAA AGAAAAGAAC AGAAACTGAG 1080
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GTTAAAGCTT CCAGAGATCA ACTAATAGCT CAAGACGTTA CAGCTAAAAA TGCAGTTCAG 1200

CAGTTACACA AAGAGATGGC CCAACGGATG GAACAGGCCA ACAAGAAATG TGAAGAGGCA 1260
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CTTCGAAAGG AAAAAGAGAC ACTTGAGAAA AAACTTAGAG ATGCAAATAA GGAACTTGAG 1380
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CTAAAAAATA TTACTTTGAA GGAAAATCTA CAAACACTTG GAACAGAAAT AGAACGTCTT 3000
ATTAAACACC AGCATGAACT AGAACAGAGG ACAAAGAAAA CCTAAAACAA GCCTCTTGCT 3060
CAGTAAAGAG ACAAAAGCCA CACAGGAGTA GGTGCCACTG ACCTCTATTG TTGGAGACTT 3120
TGTTCCACTT TTTGTTTCAG CCAGTAAAAA TATTGTTTTG CTTCATCTGT ACACAAAAAA 3180
ATACCCTTTT ACAATATGAA TGCATTGCTG TATATACTGT AAGACTGAAA GCTTTGATGA 3240
AATTTGTTTT TGTATGGTGC AATATGACAG CCTGTCATTG AATCTAAACA ACTTAATTTG 3300
CTTGTATTCA TAAGAAGTGT TGAACATTAC AAGGGCTTTT AT

SEQ ID NO:251 PBJ1 Protein sequence:

Protein Accession #: NP_060487

MVIIYLSFCN YYMEFYREEL PHIDYLIDIQ FATGKVTQPG EDTSYHQCAQ LEARDEGTDS 60
LLLNNGSSAT LKTRTRCYGT PRGLPHRSLL QPTPPTCKTK IRSRFEELQS ELVPVSMSET 120
DHIASTSSDK NVGKTPELKE DSCNLFSGNE SSKLENESKL LSLNTDKTLC QPNEHNNRIE 180
AQENYIPDHG GGEDSCAKTD TGSENSEQIA NFPSGNFAKH ISKTNETEQK VTQILVELRS 240
STFPESANEK TYSESPYDTD CTKKFISKIK SVSASEDLLE EIESELLSTE FAEHRVPNGM 300
NKGEHALVLF EKCVQDKYLQ QEHIIKKLIK ENKKHQELFV DICSEKDNLR EELKKRTETE 360
KQHMNTIKQL ESRIEELNKE VKASRDQLIA QDVTAKNAVQ QLHKEMAQRM EQANKKCEEA 420
RQEKEAMVMK YVRGEKESLD LRKEKETLEK KLRDANKELE KNTNKIKQLS QEKGRLHQLY 480
ETKEGETTRL IREIDKLKED INSHVIKVKW AQNKLKAEMD SHKETKDKLK ETTTKLTQAK 540
EEADQIRKNC QDMIKTYQES EEIKSNELDA KLRVTKGELE KQMQEKSDQL EMHHAKIKEL 600
EDLKRTFKEG MDELRTLRTK VKCLEDERLR TEDELSKYKE IINRQKAEIQ NLLDKVKTAD 660
QLQEQLQRGK QEIENLKEEV ESLNSLINDL QKDIEGSRKR ESELLLFTER LTSKNAQLQS 720
ESNSLQSQFD KVSCSESQLQ SQCEQMKQTN INLESRLLKE EELRKEEVQT LQAELACRQT 780
EVKALSTQVE ELKDELVTQR RKHASSIKDL TKQLQQARRK LDQVESGSYD KEVSSMGSRS 840
SSSGSLNARS SAEDRSPENT GSSVAVDNFP QVDKAMLIER IVRLQKAHAR KNEKIEFMED 900
HIKQLVEEIR KKTKIIQSYI LREESGTLSS EASDFNKVHL SRRGGIMASL YTSHPADNGL 960
TLELSLEINR KLQAVLEDTL LKNITLKENL QTLGTEIERL IKHQHELEQR TKKT

SEQ ID NO:252 PBJ6 DNA sequence

Nucleic Acid Accession#: D83760

Coding sequence: 56-1459 (underlined sequence corresponds to start and stop codon)

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CTCCACCACC CCCATCAGCT CCCTCTTCTC CTTCACCAGC CCCGCAGTGA AGAGACTGCT   120
AGGCTGGAAG CAAGGAGATG AAGAGGAAAA GTGGGCAGAG AAGGCAGTGG ACTCTCTAGT   180
GAAGAAGTTA AAGAAGAAGA AGGGAGCCAT GGACGAGCTG GAGAGGGCTC TCAGCTGCCC   240
GGGGCAGCCC AGCAAATGCG TCACGATTCC CCGCTCCCTG GACGGGCGGC TGCAGGTGTC   300
CCACCGCAAG GGCCTGCCCC ATGTGATTTA CTGTCGCGTG TGGCGCTGGC CGGATCTGCA   360
GTCCCACCAC GAGCTGAAGC CGCTGGAGTG CTGTGAGTTC CCATTTGGCT CCAAGCAGAA   420
AGAAGTGTGC ATTAACCCTT ACCACTACCG CCGGGTGGAG ACTCCAGTAC TGCCTCCTGT   480
GCTCGTGCCA AGACACAGTG AATATAACCC CCAGCTCAGC CTCCTGGCCA AGTTCCGCAG   540
CGCCTCCCTG CACAGTGAGC CACTCATGCC ACACAACGCC ACCTATCCTG ACTCTTTCCA   600
GCAGCCTCCG TGCTCTGCAC TCCCTCCCTC ACCCAGCCAC GCGTTCTCCC AGTCCCCGTG   660
CACGGCCAGC TACCCTCACT CCCCAGGAAG TCCTTCTGAG CCAGAGAGTC CCTATCAACA   720
CTCAGTTGAC ACACCACCCC TGCCTTATCA TGCCACAGAA GCCTCTGAGA CCCAGAGTGG   780
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CCAACCTGTA GATGCCACAG CTGATAGACA TGTAGTGCTA TCGATACCAA ATGGAGACTT    840
TCGACCAGTT TGTTACGAGG AGCCCCAGCA CTGGTGCTCG GTCGCCTACT ATGAACTGAA    900
CAACCGAGTT GGGGAGACAT TCCAGGCTTC CTCCCGAAGT GTGCTCATAG ATGGGTTCAC    960
CGACCCTTCA AATAACAGGA ACAGATTCTG TCTTGGACTT CTTTCTAATG TAAACAGAAA   1020
CTCAACGATA GAAAATACCA GGAGACATAT AGGAAAGGGT GTGCACTTGT ACTACGTCGG   1080
GGGAGAGGTG TATGCCGAGT GCGTGAGTGA CAGCAGCATC TTTGTGCAGA GCCGGAACTG   1140
CAACTATCAA CACGGCTTCC ACCCAGCTAC CGTCTGCAAG ATCCCCAGCG GCTGCAGCCT   1200
CAAGGTCTTC AACAACCAGC TCTTCGCTCA GCTCCTGGCC CAGTCAGTTC ACCACGGCTT   1260
TGAAGTCGTG TATGAACTGA CCAAGATGTG TACTATCCGG ATGAGTTTTG TTAAGGGTTG   1320
GGGTGCTGAG TATCATCGCC AGGATGTCAC CAGCACCCCC TGCTGGATTG AGATTCATCT   1380
TCATGGGCCA CTGCAGTGGC TGGACAAAGT TCTGACTCAG ATGGGCTCTC CACATAACCC   1440
CATTTCTTCA GTGTCTTAAC AGTCATGTCT TAAGCTGCAT TTCCATAGGA T
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SEQ ID NO:253 PBJ6 Protein sequence:

Protein Accession #: NP_005896

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QKEVCINPYH YRRVETPVLP PVLVPRHSEY NPQLSLLAKF RSASLHSEPL MPHNATYPDS  180
FQQPPCSALP PSPSHAFSQS PCTASYPHSP GSPSEPESPY QHSVDTPPLP YHATEASETQ  240
SGQPVDATAD RHVVLSIPNG DFRPVCYEEP QHWCSVAYYE LNNRVGETFQ ASSRSVLIDG  300
FTDPSNNRNR FCLGLLSNVN RNSTIENTRR HIGKGVHLYY VGGEVYAECV SDSSIFVQSR  360
NCNYQHGFHP ATVCKIPSGC SLKVFNNQLF AQLLAQSVHH GFEVVYELTK MCTIRMSFVK  420
GWGAEYHRQD VTSTPCWIEI HLHGPLQWLD KVLTQMGSPH NPISSVS
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SEQ ID NO:254 PBJ8 DNA sequence

Nucleic Acid Accession#: AB04684

Coding sequence: 472-4377 (underlined sequence corresponds to start and stop codon)

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TGGGGACACT TGGTTGATGC AGTCTCTCTC TCTCTTTCTC GGTGTTTATA ACAAAACAAA    180
ACCAAAATGA ACTGAGGGGT TTGTAATGGT AGTTTGTTTG TTGCTGGAGA ATGCTACTTT    240
GCATGCTTTT TTTCTCTTGC AGGGTATGTT CTGTCTTGTG CTTTTTCTTT TAGAAGCTAC    300
TAAAGGGTGT TGGGGATGCT TCTGACTATT ATGAAGGCCA AAAGGCCTGT TGACTGGGGC    360
TGCTTTTAAC CCTTTCCTAT TTGCTGAGAA TGCAGCCGTG TGACAGTAAC TGAACATTGG    420
TCTAAAGTCT TTCCAAAAGG TCAAGGTTCA CAAGAACATC TGCTCAAATT AATGACCATG    480
GGGGATATGA AGACCCCAGA CTTTGATGAC CTCCTGGCAG CATTTGACAT CCCAGATATG    540
GTCGATCCTA AAGCAGCTAT TGAGTCTGGA CACGATGACC ATGAAAGCCA CATGAAGCAG    600
AATGCTCACG GAGAGGATGA CTCCCACGCA CCATCATCTT CTGATGTGGG TGTCAGCGTT    660
ATCGTCAAGA ATGTTCGGAA CATTGACTCT TCCGAGGGCG GGGAGAAAGA CGGCCACAAC    720
CCCACTGGCA ATGGCTTACA TAATGGGTTT CTCACAGCAT CCTCCCTTGA CAGTTACAGT    780
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TCGACATTCA GCCAGTTTAG CCCGATCTCC AGTGCTGAAG AGTTTGATGA CGACGAGAAG    900
ATTGAGGTGG ATGACCCCCC TGACAAGGAG GACATGCGAT CAAGCTTCAG GTCGAATGTG    960
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TCCAGCAAAA CTGGACTCTC TACGTCAGGC AATGTGGAGA AAAACAAAGC TGTTAAGAGA   1080
GAAACAGAAG CCAGTTCTAT AAACCTGAGT GTTTATGAAC CTTTTAAAGT CAGAAAAGCA   1140
GAGGATAAAT TGAAGGAAAG CTCTGACAAG GTGCTGGAAA ACAGAGTCCT AGATGGGAAG   1200
CTGAGCTCCG AGAAGAATGA CACCAGCCTC CCCAGCGTTG CGCCATCAAA GACAAAGTCG   1260
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TCAGACTCCT GCAAAGAACC AGTGGCCAAT TCGAGGGAAT CCTCCCCGTT ACCAAAAGAA   1380
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ACCAAAAAAC CATCCCTGAA GCAACCGGAT AGTCCCAGAA GCATCTCAAG TGAGAACAGC   1500
AGCAAAGGAT CCCCGTCCTC TCCCGCAGGG TCCACACCAG CAATCCCCAA AGTCCGCATA   1560
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GTGGATCTTG ACTCTGGAAA GAAACCTTCC GAGCAGACAG CGTCCGTGAT GGCCTCTGTG   1680
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CAAGTCATTA ATTTGAAGCT CGCTAACAAC ACCACGGTGA AAGCCACGGT CATATCTGCT   1920
GCCTCTGTCC AGAGTGCCAG CAGCGCCATC ATTAAAGCTG CCAACGCCAT CCAGCAGCAA   1980
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GTTCCTCAAA AGGTCTTGCT GCTGTCAGGT GTTATGCACT CCATCCATCA TAACTGTATG 5820
AAACACATTT CATATGTAAA TAAACGTGGG ACATTTG

SEQ ID NO:255 PBJ8 Protein sequence:

Protein Accession #: BAB13455

MKTPDFDDLL AAFDIPDMVD PKAAIESGHD DHESHMKQNA HGEDDSHAPS SSDVGVSVIV 60
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FSQFSPISSA EEFDDDEKIE VDDPPDKEDM RSSFRSNVLT GSAPQQDYDK LKALGGENSS 180
KTGLSTSGNV EKNKAVKRET EASSINLSVY EPFKVRKAED KLKESSDKVL ENRVLDGKLS 240
SEKNDTSLPS VAPSKTKSSS KLSSCIAAIA ALSAKKAASD SCKEPVANSR ESSPLPKEVN 300
DSPRAADKSP ESQNLIDGTK KPSLKQPDSP RSISSENSSK GSPSSPAGST PAIPKVRIKT 360
IKTSSGEIKR TVTRVLPEVD LDSGKKPSEQ TASVMASVTS LLSSPASAAV LSSPPRAPLQ 420
SAVVTNAVSP AELTPKQVTI KPVATAFLPV SAVKTAGSQV INLKLANNTT VKATVISAAS 480
VQSASSAIIK AANAIQQQTV VVPASSLANA KLVPKTVHLA NLNLLPQGAQ ATSELRQVLT 540
KPQQQIKQAI INAAASQPPK KVSRVQVVSS LQSSVVEAFN KVLSSVNPVP VYIPNLSPPA 600
NAGITLPTRG YKCLECGDSF ALEKSLTQHY DRRSVRIEVT CNHCTKNLVF YNKCSLLSHA 660
RGHKEKGVVM QCSHLILKPV PADQMIVSPS SNTSTSTSTL QSPVGAGTHT VTKIQSGITG 720
TVISAPSSTP ITPAMPLDED PSKLCRHSLK CLECNEVFQD ETSLATHFQQ AADTSGQKTC 780
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HCNVVYSDVA ALKSHIQGSH CEVFYKCPIC PMAFKSAPST HSHAYTQHPG IKIGEPKIIY 900
KCSMCDTVFT LQTLLYRHFD QHIENQKVSV FKCPDCSLLY AQKQLMMDHI KSMHGTLKSI 960
EGPPNLGINL PLSIKPATQN SANQNKEDTK SMNGKEKLEK KSPSPVKKSM ETKKVASPGW 1020
TCWECDCLFM QRDVYISHVR KEHGKQMKKH PCRQCDKSFS SSHSLCRHNR IKHKGIRKVY 1080
ACSHCPDSRR TFTKRLMLEK HVQLMHGIKD PDLKEMTDAT NEEETEIKED TKVPSPKRKL 1140
EEPVLEFRPP RGAITQPLKK LKINVFKVHK CAVCGFTTEN LLQFHEHIPQ HKSDGSSYQC 1200
RECGLCYTSH VSLSRHLFIV HKLKEPQPVS KQNGAGEDNQ QENKPSHEDE SPDGAVSDRK 1260
CKVCAKTFET EAALNTHMRT HGMAFIKSKR MSSAEK

SEQ ID NO:256 PBM1 DNA sequence
Nucleic Acid Accession#: AF111847
Coding sequence: 58-1608 (underlined sequence corresponds to start and stop codon)

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GTGTTCCTTT GCATTGATTG CTCAGGGTCC CACCGGTCAC TTGGTGTTCA CTTGAGTTTT  240
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SEQ ID NO:257 PBM1 Protein sequence:
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SEQ ID NO:258 PBM4 DNA sequence
Nucleic Acid Accession#: D30891
Coding sequence: 1-4032 (underlined sequence corresponds to start and stop codon)

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Coding sequence: 489-2489 (underlined sequence corresponds to start and stop codon)

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SEQ ID NO:261 PBQ1 Protein sequence:

PBQ1 Protein sequence: NP_056457

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SEQ ID NO: 262 PBQ8 DNA sequence

Nucleic Acid Accession#: AI654187

Coding sequence: 1-912 (underlined sequence corresponds to start and stop codon)

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AGCAGCAAAT TAGAAAATGA GTCCAAACTA TTGTCATTAA ACACTGATAA AACTTTATGT   360
CAACCTAATG AGCATAATAA TCGAATTGAA GCCCAGGAAA ATTATATTCC AGATCATGGT   420
GGAGGTGAGG ATTCTTGTGC CAAAACAGAC ACAGGCTCAG AAAATTCTGA ACAAATAGCT   480
AATTTTCCTA GTGGAAATTT TGCTAAACAT ATTTCAAAAA CAAATGAAAC AGAACAGAAA   540
GTAACACAAA TATTGGTGGA ATTAAGGTCA TCTACATTTC CAGAATCAGC TAATGAAAAG   600
ACTTATTCAG AAAGCCCCTA TGATACAGAC TGCACCAAGA AATTTATTTC AAAAATAAAG   660
AGCGTTTCAG CATCAGAGGA TTTGTTGGAA GAAATAGAAT CTGAGCTCTT ATCTACGGAG   720
TTTGCAGAAC ATCGAGTACC AAATGGAATG AATAAGGGAG AACATGCATT AGTTCTGTTT   780
GAAAAGTGTG TGCAAGATAA ATATTTGCAG CAGGAACATA TCATAAAAAA GGCCAGACTT   840
GGTCTCTGTT ATTTGCCATC AAGAACCTCA ATTGACACGT TAATTCCGTT TATCCCAAAT   900
TTATATAGAT AA
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SEQ ID NO:263 PBQ8 Protein sequence:

Protein Accession #: NP_060170

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MEPKEATGKE NMVTKKKNLA FLRSRLYMLE RRKTDTVVES SVSGDHSGTL RRSQSDRTEY  60
NQKLQEKMTP QGECSVAETL TPEEEHHMKR MMAKREKIIK ELIQTEKDYL NDLELCVREV  120
VQPLRNKKTD RLDVDSLFSN IESVHQISAK LLSLLEEATT DVEPAMQVIG EVFLQIKGPL  180
EDIYKIYCYH HDEAHSILES YEKEEELKEH LSHCIQSLK
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SEQ ID NO:264 PBY7 DNA sequence

Nucleic Acid Accession#: NM_014323

Coding sequence: 662-2725 (underlined sequence corresponds to start and stop codon)

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1          11         21         31         41         51
|          |          |          |          |          |
GGGCCTACTC TGCCGCCGCC GCCGCCCGCC CGCTCCAGCC GCCGCCGCCG CCGCCACCGC    60
CCTCCAGGCT CCGGGACCCG GCCCGCGCCA CCGCCCCCGT GCGCGCCCCG CCGCCGCCGC   120
CTTCGCCTTC GCCTTTTGTT TCCTCCGCTC CGGCGCCCCC GCCCCGGCTC GCGCTTTGCA   180
GGGGACGCAG CGCGCGCCCC CAGCGGGCCC GGGAAAAGCC GCGGCGCGCG CGCGCGCCTG   240
CGCGGCGGAC CCCTCCTTCT CCTCCCCGCG TGCGCGTGCC CTTCTTGGCT GCGCGCCGGC   300
GCCGCCTGGC GGGCGGGAGG GGAGGTGGCA GGCGCGTTTG CAGGAGGGGC GCACCTCTTC   360
GCTCGCGCAC CCCCCCGGAA GGTAGACCGG GAAGGGGAGG CGGGCGGGCG GAGAGGAGAG   420
AGTGGCGCGC AGTCCAGCGA GGGCGGGGGT TGGCTATGTG GGGGGTGGTG CACCCCGCAG   480
TCTAGACAGT CTGATCCGGG CTGGGGGCGT GTACACTCGG CGCACCTGCG AGACTACAGA   540
GCCTCGGGCC GGCACGTGTG GGGAGTGTGG ACACGTCTGC TGCGCCCCGC TTCTCGCTGC   600
```

TGAGGGGAAG GGAGGGGGCG GGCAGGTGCA GCGGCCGGGC TAGTGGGAGG GGGCGGCGGC 660
CATGGAGCGG GTGAACGACG CTTCGTGCGG CCCGTCTGGC TGCTACACAT ACCAGGTGAG 720
CAGACACAGC ACGGAGATGC TGCACAACCT GAACCAGCAG CGCAAAAACG GCGGGCGCTT 780
CTGCGACGTG CTCTTGCGGG TAGGCGACGA GAGCTTCCCA GCGCACCGCG CCGTGCTGGC 840
CGCCTGCAGC GAGTACTTTG AGTCGGTGTT CAGCGCCCAG TTGGGCGACG GCGGAGCTGC 900
GGACGGGGGT CCGGCTGATG TAGGGGGCGC GACGGCAGCA CCAGGCGGCG GGGCCGGGGG 960
CAGCCGGGAG CTGGAGATGC ACACTATCAG CTCCAAGGTA TTTGGGGACA TTCTGGACTT 1020
CGCCTACACT TCCCGCATCG TGGTGCGCTT GGAGAGCTTT CCCGAACTCA TGACGGCCGC 1080
CAAGTTCCTG CTGATGAGGT CGGTTATCGA GATCTGCCAG GAAGTCATCA AACAGTCCAA 1140
CGTACAGATC CTGGTACCCC CTGCCCGCGC CGATATAATG CTCTTTCGCC CCCCTGGGAC 1200
CTCGGACTTG GGCTTCCCTT TGGACATGAC CAACGGGGCA GCCTTGGCAG CCAACAGCAA 1260
TGGCATCGCC GGCAGCATGC AGCCAGAGGA GGAGGCAGCT CGGGCGGCTG GTGCAGCCAT 1320
TGCAGGCCAA GCCTCTTTGC CTGTGTTACC TGGGGTGGAC CGCTTGCCCA TGGTGGCTGG 1380
ACCCCTATCC CCCCAACTGC TGACTTCCCC ATTCCCCAGT GTGGCATCCA GTGCCCCTCC 1440
CCTGACTGGC AAGCGAGGCC GGGGCCGCCC AAGGAAGGCC AACCTGCTGG ACTCAATGTT 1500
TGGGTCCCCA GGGGGCCTGA GGGAGGCAGG CATCCTTCCA TGCGGTCTAT GTGGTAAGGT 1560
GTTCACTGAT GCCAACCGGC TCCGGCAGCA CGAGGCCCAG CACGGTGTCA CCAGCCTCCA 1620
GCTGGGCTAC ATCGACCTTC CTCCTCCGAG GCTGGGTGAG AATGGGCTAC CCATCTCTGA 1680
AGACCCCGAC GGCCCCCGAA AGAGGAGCCG GACCAGGAAG CAGGTGGCTT GTGAGATCTG 1740
CGGCAAGATC TTCCGTGATG TGTATCATCT TAACCGGCAC AAGCTGTCCC ACTCTGGGGA 1800
GAAGCCCTAC TCCTGCCCTG TGTGTGGGTT GCGGTTCAAG AGAAAAGACC GCATGTCCTA 1860
CCATGTGCGG TCCCATGATG GGTCCGTGGG CAAGCCTTAC ATCTGCCAGA GCTGTGGGAA 1920
AGGCTTCTCC AGGCCTGATC ACTTGAACGG ACATATCAAG CAGGTGCACA CTTCTGAGCG 1980
GCCTCACAAG TGTCAGACCT GCAATGCTTC TTTTGCCACC CGAGACCGTC TGCGCTCCCA 2040
CCTGGCCTGT CATGAAGACA AGGTGCCCTG CCAGGTGTGT GGGAAGTACT TGCGGGCAGC 2100
ATACATGGCA GACCACCTGA AGAAGCACAG CGAGGGGCCC AGCAACTTCT GCAGTATCTG 2160
TAACCGAGGT TTCTCCTCTG CCTCCTACTT AAAGGTCCAT GTTAAAACCC ACCACGGTGT 2220
TCCCCTTCCC CAGGTCTCCA GGCACCAGGA GCCCATCCTG AATGGGGGAG CAGCGTTCCA 2280
CTGCGCCAGG ACCTATGGCA ACAAAGAAGG CCAGAAATGC TCACATCAGG ATCCGATTGA 2340
GAGCTCTGAC TCCTATGGTG ACCTCTCAGA TGCCAGCGAC CTGAAGACGC CAGAGAAGCA 2400
GAGTGCCAAT GGCTCTTTCT CCTGCGACAT GGCAGTCCCC AAAAACAAAA TGGAGTCTGA 2460
TGGGGAGAAG AAGTACCCAT GCCCTGAATG TGGGAGCTTC TTCCGCTCTA AGTCCTACTT 2520
GAACAAACAC ATCCAGAAGG TGCATGTCCG GGCTCTCGGG GGCCCCCTGG GGGACCTGGG 2580
CCCTGCCCTT GGCTCACCTT TCTCTCCTCA GCAGAACATG TCTCTCCTCG AGTCCTTTGG 2640
GTTTCAGATT GTTCAGTCGG CATTTGCGTC ATCTTTAGTA GATCCTGAGG TTGACCAGCA 2700
GCCCATGGGG CCTGAAGGGA AATGAGGCAG CTGCTGTGTC CCCACGGAAA CAACCATCTG 2760
GGGACTGCTG GGAAATGCTG TGAATGCGGA GGGAAGTGAT GTTTGGGTTC TGTAGCTGAG 2820
AGATTTTTAT TCATTTTTAA CTGCCCCCCA ACCCCACTCC AACTCCTTCT CCACCACCCA 2880
TTCTCCCAAT GGTCTTTAGA AATAGATTTT CATCTGATAT TCTGCAGAAA TATCAATGAG 2940
ACTTGGTATG GGACAGGGGC AGAAAACACT ACATAGGCCT CCAAGGCAAA ACCAGTCCCA 3000
GTTTCTTTAA TGGGAAGAAG CTGGAATTCC TGGTGCTCAA TTCTTAGTGA CCCCAATCCT 3060
ATACCCAAAT CTATGATATT CTGGGACCTC AGTGATTTTG GTCCCCTCCC ACTTCTCTAG 3120
TTCGTCATCC TCCCTTCCCA TATCCTTCAA AAGAACCACA CTAGGGTCTC CACCTACTTA 3180
TACAATGCGG ATGCCCAACT GTTTTTAAGG AAGCCAGAAG CATCCCATGG ACCATGGGGT 3240
GAGTGTCCTC CAAGAGCCCC CTGAGCTCAG CCCTCTGCCT GGAGGGCTCC AGACCTTTCT 3300
GAGCCCTGCT TGGAGGCGAG CATTTTCACT GCTAGGACAA GCTCAGCTGT TGAGGACACC 3360
CCCACCCCAA ATTTCAGTTC TTACGTGATT TTAACCATTC AACATGCTGT TGGGTTTTAA 3420
TTCTCTAATT ATTATTATTA TTGTTATTAT TTTTTAGGAC CAGTTGTAGT GAATTGCTAC 3480
TGAAAGCTAT CCCAGGTGAT ACAGAGCTCT TTGTAAACCG CAGTCACACA TTAGGGTTAG 3540
TATTAAACTT TGTTTAGATG TACCATAATT AACTTGGCTA GTTGATTGTT TGAAGTCTAT 3600
GGAAGAAATA GTTTTATGCA AAATTTTAAA AAATGCCAGT CTGGTCAGGG AAGTAGGGGG 3660
TTTCAATGCT GTTGGGAACC AGGAAGGTGG GACAGCCGGC AGGTAGGGAC ATTGTGTACC 3720
TCAGTTGTGT CACATGTGAG CAAGCCCAGG TTGACCTTGT GATGTGAATT GATCTGATCA 3780
GACTGTATTA AAAATGTTAG TACATTACTC TA

SEQ ID NO:265 PBY7 Protein sequence:
Protein Accession #: NP_114439

MERVNDASCG PSGCYTYQVS RHSTEMLHNL NQQRKNGGRF CDVLLRVGDE SFPAHRAVLA 60
ACSEYFESVF SAQLGDGGAA DGGPADVGGA TAAPGGGAGG SRELEMHTIS SKVFGDILDF 120
AYTSRIVVRL ESFPELMTAA KFLLMRSVIE ICQEVIKQSN VQILVPPARA DIMLFRPPGT 180
SDLGFPLDMT NGAALAANSN GIAGSMQPEE EAARAAGAAI AGQASLPVLP GVDRLPMVAG 240
PLSPQLLTSP FPSVASSAPP LTGKRGRGRP RKANLLDSMF GSPGGLREAG ILPCGLCGKV 300
FTDANRLRQH EAQHGVTSLQ LGYIDLPPPR LGENGLPISE DPDGPRKRSR TRKQVACEIC 360
GKIFRDVYHL NRHKLSHSGE KPYSCPVCGL RFKRKDRMSY HVRSHDGSVG KPYICQSCGK 420
GFSRPDHLNG HIKQVHTSER PHKCQTCNAS FATRDRLRSH LACHEDKVPC QVCGKYLRAA 480
YMADHLKKHS EGPSNFCSIC NREGQKCSHQ DPIESSDSYG DLSDASDLKT PEKQSANGSF 540
SCDMAVPKNK MESDGEKKYP CPECGSFFRS KSYLNKHIQK VHVRALGGPL GDLGPALGSP 600
FSPQQNMSLL ESFGFQIVQS AFASSLVDPE VDQQPMGPEG K

SEQ ID NO:266 PBY9 DNA sequence
Nucleic Acid Accession#: NM_012429
Coding sequence: 174-1385 (underlined sequence corresponds to start and stop codon)

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1          11         21         31         41         51
|          |          |          |          |          |
CCCTACTCCG CCTCTCGGGA TCCTTTAAGA GGCGGGGCTT GGCTGCCAGC TCCGCGGCCC     60
GGGCAAAAGG CTGGGACTTT ACTCCGGGTG GCGGCGAGGA CGAGTCTGTG CTCCATCAGC    120
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TGCCGCACCC GCCGCCTCCC GCCCCCAAAC CCCATCCCCG CGGTTGAGCC ACGATGAGCG   180
GCAGAGTCGG CGATCTGAGC CCCAGGCAGA AGGAGGCATT GGCCAAGTTT CGGGAGAATG   240
TCCAGGATGT GCTGCCGGCC CTGCCGAATC CAGATGACTA TTTTCTCCTG CGTTGGCTCC   300
GAGCCAGAAG CTTCGACCTG CAGAAGTCGG AGGCCATGCT CCGGAAGCAT GTGGAGTTCC   360
GAAAGCAAAA GGACATTGAC AACATCATTA GCTGGCAGCC TCCAGAGGTG ATCCAACAGT   420
ATCTGTCAGG GGGTATGTGT GGCTATGACC TGGATGGCTG CCCAGTCTGG TACGACATAA   480
TTGGACCTCT GGATGCCAAG GGTCTGCTGT TCTCAGCCTC CAAACAGGAC CTGCTGAGGA   540
CCAAGATGCG GGAGTGTGAG CTGCTTCTGC AAGAGTGTGC CCACCAGACC ACAAAGTTGG   600
GGAGGAAGGT GGAGACCATC ACCATAATTT ATGACTGCGA GGGGCTTGGC CTCAAGCATC   660
TCTGGAAGCC TGCTGTGGAG GCCTATGGAG AGTTTCTCTG CATGTTTGAG GAAAATTATC   720
CCGAAACACT GAAGCGTCTT TTTGTTGTTA AAGCCCCCAA ACTGTTTCCT GTGGCCTATA   780
ACCTCATCAA ACCCTTCCTG AGTGAGGACA CTCGTAAGAA GATCATGGTC CTGGGAGCAA   840
ATTGGAAGGA GGTTTTACTG AAACATATCA GCCCTGACCA GGTGCCTGTG GAGTATGGGG   900
GCACCATGAC TGACCCTGAT GGAAACCCCA AGTGCAAATC CAAGATCAAC TACGGGGGTG   960
ACATCCCCAG GAAGTATTAT GTGCGAGACC AGGTGAAACA GCAGTATGAA CACAGCGTGC  1020
AGATTTCCCG TGGCTCCTCC CACCAAGTGG AGTATGAGAT CCTCTTCCCT GGCTGTGTCC  1080
TCAGGTGGCA GTTTATGTCA GATGGAGCGG ATGTTGGTTT TGGGATTTTC CTGAAGACCA  1140
AGATGGGAGA GAGGCAGCGG GCAGGGGAGA TGACAGAGGT GCTGCCCAAC CAGAGGTACA  1200
ACTCCCACCT GGTCCCTGAA GATGGGACCC TCACCTGCAG TGATCCTGGC ATCTATGTCC  1260
TGCGGTTTGA CAACACCTAC AGCTTCATTC ATGCCAAGAA GGTCAATTTC ACTGTGGAGG  1320
TCCTGCTTCC AGACAAAGCC TCAGAAGAGA AGATGAAACA GCTGGGGGCA GGCACCCCGA  1380
AATAACACCT TCTCCTATAG CAGGCCTGGC CCCCTCAGTG TCTCCCTGTC AATTTCTACC  1440
CCTTGTAGCA GTCATTTTCG CACAACCCTG AAGCCCAAAG AAACTGGGCT GGAGGACAGA  1500
CCTCAGGAGC TTTCATTTCA GTTAGGCAGA GGAAGAGCGA CTGCAGTGGG TCTCCGTGTC  1560
TATCAAATAC CTAAGGAGTC CCCAGGAGCT GGCTGGCCAT CGTGATAGGA TCTGTCTGTC  1620
CTGTAAACTG TGCCAACTTC ACCTGTCCAG GGACAGCGAA GCTGGGGGTG GCGGGGGGCA  1680
TGTACCACAG GGTGGCAGCA GGGAAAAAAA TTAGAAAAGG GTGAAAGATT GGGACTTAAC  1740
ACTTCAGGGA AGTCAGCTGC CGGGGAGAAA CTTGCTCCTA AATGAACACA TAAGTTTAGA  1800
TCGCAATGAG GAGTAGCAGG GTAGCTGGTT GCTAGAGTTA CGGTGGGGAT CAGAAACTCT  1860
TCCAAACATT TTAGCACTGA GGCTGGGGTA GCTTTTGGCT TTTCCCAGGT CTCAGGAGGT  1920
GGCCTGAGTC AGCACACATC TTCCCACTCG GTAGACAGGC TGGCCTCTCC CTCACTTTGA  1980
GACTTTGGCA ACTCCTGGGC CACACGGCCT GCCTCTTTGA TTACTAATGA TTGTCAGTGA  2040
CTCAGAGCTT CCTGGGACTT CGGGTACCCA CCCGCTGTTC TCCATGCAAA CAAAGCGCCA  2100
GGGAAATGAC CCACAGGGAT CGCAGCTGCA GGGAGGGCCA GGGAGGTTGG GGGTGGGAGT  2160
GAATGCTAAA AGCAGATCGT CCAGTGCCCT TTTCAGTGCT ACCGGCCTCT CACCAAGCAG  2220
TCCTCCATGT GAGCAACCCC GAGACAAAAA TGCTAAGTGG GATCAAGAGA GCAGCACTCG  2280
GAGAGGGTGT TTGCCAGTCT GAGTGTCCCG CGGTGCCCGC CAACCCGCTT CCTGACTGAC  2340
CTGAGCAAGG TCTTACTAAG CAGTCCCATC TCTGTGGGAG GCATGCAACG CGTGCAGGGA  2400
GTTCAGGTGC CGGTCGGCGT AGCCAGGCCT GGAGGCCCCC CAGGCAGGAG GCCGCCCAAA  2460
GGCGGGGCCG GCGTCTCGCA GACTAGGGGC TGGGGGCGGC CACAGACGGC CTCGAAACCA  2520
CAGCCCTTAC CCCAATCCCA CGAGCCCCGC CAACGAACCA CAGGTGCTGG GCTTTAGAGA  2580
ACATGGGAAG GCGGCCCCAG ACCTGGCGGG AACGCCTTTC CCTCAGAGCC AGGCCCCGGC  2640
CCCGTCTGGG AAGCTCATCT TGCGAAGCTG AGGGAGCTCA GGGCAAAGGC CAGGCTAGCG  2700
CGGACCGGAA GGGGCCGAGG CTGCACGGGC CTCTGCCAGA ACGCTCAGGA CATCCCGGCC  2760
TGGGTTTACA ACGCTGTTAG GAAAATTAAC CAATGAATAA AGCAACGTTC AGTGCGCA
```

SEQ ID NO:267 PBY9 Protein sequence:

Protein Accession #: NP_036561

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MSGRVGDLSP RQKEALAKFR ENVQDVLPAL PNPDDYFLLR WLRARSFDLQ KSEAMLRKHV   60
EFRKQKDIDN IISWQPPEVI QQYLSGGMCG YDLDGCPVWY DIIGPLDAKG LLFSASKQDL  120
LRTKMRECEL LLQECAHQTT KLGRKVETIT IIYDCEGLGL KHLWKPAVEA YGEFLCMFEE  180
NYPETLKRLF VVKAPKLFPV AYNLIKPFLS EDTRKKIMVL GANWKEVLLK HISPDQVPVE  240
YGGTMTDPDG NPKCKSKINY GGDIPRKYYV RDQVKQQYEH SVQISRGSSH QVEYEILFPG  300
CVLRWQFMSD GADVGFGIFL KTKMGERQRA GEMTEVLPNQ RYNSHLVPED GTLTCSDPGI  360
YVLRFDNTYS FIHAKKVNFT VEVLLPDKAS EEKMKQLGAG TPK
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SEQ ID NO:268 PBH8 DNA sequence

Nucleic Acid Accession#: XM_009756

Coding sequence: 301-1440 (underlined sequence corresponds to start and stop codon)

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1          11         21         31         41         51
|          |          |          |          |          |
GTGGGGACAG CCGAGCCGCG CCGGGCCCCT GGACGGCGTC GCCAAGGAGC TGGGATCGCA    60
CTTGCTGCAG ACTTTGGATG GATTTGTTTT TGTGGTAGCA TCTGATGGCA AAATCATGTA   120
TATATCCGAG ACCGCTTCTG TCCATTTAGG CTTATCCCAG GTGGAGCTCA CGGGCAACAG   180
TATTTATGAA TACATCCATC CTTCTGACCA CGATGAGATG ACCGCTGTCC TCACGGCCCA   240
CCAGCCGCTG CACCACCACC TGCTCCAAGG TATGAGATAG AGAGGTCGTT CTTTCTTCGA   300
ATGAAATGTG TCTTGGCGAA AAGGAACGCG GGCCTGACCT GCAGCGGATA CAAGGTCATC   360
CACTGCAGTG GCTACTTGAA GATCAGGCAG TATATGCTGG ACATGTCCCT GTACGACTCC   420
TGCTACCAGA TTGTGGGGCT GGTGGCCGTG GGCCAGTCGC TGCCACCCAG TGCCATCACC   480
GAGATCAAGC TGTACAGTAA CATGTTCATG TTCAGGGCCA GCCTTGACCT GAAGCTGATA   540
TTCCTGGATT CCAGGGTGAC CGAGGTGACG GGGTACGAGC CGCAGGACCT GATCGAGAAG   600
ACCCTATACC ATCACGTGCA CGGCTGCGAC GTGTTCCACC TCCGCTACGC ACACCACCTC   660
CTGTTGGTGA AGGGCCAGGT CACCACCAAG TACTACCGGC TGCTGTCCAA GCGGGGCGGC   720
TGGGTGTGGG TGCAGAGCTA CGCCACCGTG GTGCACAACA GCCGCTCGTC CCGGCCCCAC   780
TGCATCGTGA GTGTCAATTA TGTACTCACG GAGATTGAAT ACAAGGAACT TCAGCTGTCC   840
CTGGAGCAGG TGTCCACTGC CAAGTCCCAG GACTCCTGGA GGACCGCCTT GTCTACCTCA   900
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CAAGAAACTA GGAAATTAGT GAAACCCAAA AATACCAAGA TGAAGACAAA GCTGAGAACA 960
AACCCTTACC CCCCACAGCA ATACAGCTCG TTCCAAATGG ACAAACTGGA ATGCGGCCAG 1020
CTCGGAAACT GGAGAGCCAG TCCCCCTGCA AGCGCTGCTG CTCCTCCAGA ACTGCAGCCC 1080
CACTCAGAAA GCAGTGACCT TCTGTACACG CCATCCTACA GCCTGCCCTT CTCCTACCAT 1140
TACGGACACT TCCCTCTGGA CTCTCACGTC TTCAGCAGCA AAAAGCCAAT GTTGCCGGCC 1200
AAGTTCGGGC AGCCCCAAGG ATCCCCTTGT GAGGTGGCAC GCTTTTTCCT GAGCACACTG 1260
CCAGCCAGCG GTGAATGCCA GTGGCATTAT GCCAACCCCC TAGTGCCTAG CAGCTCGTCT 1320
CCAGCTAAAA ATCCTCCAGA GCCACCGGCG AACACTGCTA GGCACAGCCT GGTGCCAAGC 1380
TACGAAGGCA AGCAGATGTC CTCTGCGGAG ATACCGCCAG CTCCCCAGGA CGCAGACTGA 1440
CTCCTGTTTG CTCGCTGGAC CAAC

SEQ ID NO:269 PBH8 Protein sequence:
Protein Accession #: NP_005060

MKEKSKNAAK TRREKENGEF YELAKLLPLP SAITSQLDKA SIIRLTTSYL KMRAVFPEGL 60
GDAWGQPSRA GPLDGVAKEL GSHLLQTLDG FVFVVASDGK IMYISETASV HLGLSQVELT 120
GNSIYEYIHP SDHDEMTAVL TAHQPLHHHL LQEYEIERSF FLRMKCVLAK RNAGLTCSGY 180
KVIHCSGYLK IRQYMLDMSL YDSCYQIVGL VAVGQSLPPS AITEIKLYSN MFMFRASLDL 240
KLIFLDSRVT EVTGYEPQDL IEKTLYHHVH GCDVFHLRYA HHLLLVKGQV TTKYYRLLSK 300
RGGWVWVQSY ATVVHNSRSS RPHCIVSVNY VLTEIEYKEL QLSLEQVSTA KSQDSWRTAL 360
STSQETRKLV KPKNTKMKTK LRTNPYPPQQ YSSFQMDKLE CGQLGNWRAS PPASAAAPPE 420
LQPHSESSDL LYTPSYSLPF SYHYGHFPLD SHVFSSKKPM LPAKFGQPQG SPCEVARFFL 480
STLPASGECQ WHYANPLVPS SSSPAKNPPE PPANTARHSL VPSYEAPAAA VRRFGEDTAP 540
PSFPSCGHYR EEPALGPAKA ARQAARDGAR LALARAAPEC CAPPTPEAPG APAQLPFVLL 600
NYHRVLARRG PLGGAAPAAS GLACAPGGPE AATGALRLRH PSPAATSPPG APLPHYLGAS 660
VIITNGR

SEQ ID NO:270 PBJ9 DNA sequence:
Nucleic Acid Accession#: AA760894

GGCACGAGGA GAAGATGTGG CTTGCTCATG CTTGACTTCT GCCATGGTTG TGAGGCCTCC 60
CCAGCCATGT GGAACTGTTT TCAGGTGCTG GTTCCATGGC TCTTCCTGAG CCGAAAATAA 120
GGAAACTCCA TAGACCTTGT CCACTGGAAC TCGTTCCCAT CTACCCTCCA CTCTATCCAG 180
GGTGATGGAT CTCTGCAGTA AGTGGAAGAG TTCTTCATGG CCCCCAAGGT TATATCCATC 240
TAGAACTTCA GCACGTAATT TCATCTGGAA ATAGTGCCTT TGTGGATATA AGTTAGGTAA 300
AACTGAAGAT GAGATCATAC TGGATTAGGA TGGATCTAA ATCCAATGAA AATGTCTTCA 360
TAAAAAACAG GAAAGAACCC ATAGAAACAC AAGGAAGAAG GTCATGTGAA GATGGAGGCA 420
GAGATTGGAG GGATGCAGCC ACCGGCCCAG GAATGCCAGC AGCCACCCAG AAGCTGGAAG 480
GAAATGAGGG ATTCTCTCCT AGAACCTTTA GAGAGRACAT GGTCCTGTGA ACAGCTTGAT 540
TTTGGACTTG CCCATAGCTT GTATACTCTT ACTTTGGATA CAATTTTATC CAAACTTGGC 600
TAAACAGTTT CTCAGCCTAT GGAAAATTTA AAATGGAGAA GATTCAACTC GATTCTTACA 660
GATTCAAAGC AAGAAAATGA TGGGAACATA GGAGGAGACC AAGAAAAGCCT ATAAAAAGCA 720
AAAATATGAA GTGAACATTG TGGTAGCTTT AAGATGTTTA GTGTAGCTGC AGGCACCCTA 780
TACACATGAA AACCCCCAAG GGGAATCCCC ATATCACAGT GTAGTGTGAT ATTTGACATT 840
YGTGATCATY TAGAGATGTA CAGAAAAGGT GAATCTGTGT TCTGTATATT CTGCCTAAGG 900
CAAAGAAATG TTTAGCTTYC TTTAAAATAG TTCCATAATT TTTTYAAAA AGCTTTGCTT 960
GAAAACTGTA AGCTTCCCAT ATCTGGAGCA TTTCACTTTA AATATTTGGA TAAATATGTT 1020
ATCTTCTTAC TTGGACATTT CATGTGTTTA GGGATTGTYT TYTAAATTCT TCCTAATTCA 1080
TATAGCTGCT AACACTTCCC GCAGAGCTAA ACCATTACAG ANTATGAAAT AAAGACCCTA 1140
TTGATTTGAA CTTAAAAAAA AAAAMAMAAA AAAAAAAAAA AAAAAAAAAT GA

SEQ ID NO:271 PBQ4 DNA sequence
Nucleic Acid Accession#: AA149579
Coding sequence: 1-1363 (underlined sequence corresponds to start and stop codon)

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ATGGAATCAA TCTCTATGAT GGGAAGCCCT AAGAGCCTTA GTGAAACTTG TTTACCTAAT   60
GGCATAAATG GTATCAAAGA TGCAAGGAAG GTCACTGTAG GTGTGATTGG AAGTGGAGAT  120
TTTGCCAAAT CCTTGACCAT TCGACTTATT AGATGCGGCT ATCATGTGGT CATAGGAAGT  180
AGAAATCCTA AGTTTGCTTC TGAATTTTTT CCTCATGTGG TAGATGTCAC TCATCATGAA  240
GATGCTCTCA CAAAAACAAA TATAATATTT GTTGCTATAC ACAGAGAACA TTATACCTCC  300
CTGTGGGACC TGAGACATCT GCTTGTGGGT AAAATCCTGA TTGATGTGAG CAATAACATG  360
AGGATAAACC AGTACCCAGA ATCCAATGCT GAATATTTGG CTTCATTATT CCCAGATTCT  420
TTGATTGTCA AAGGATTTAA TGTTGTCTCA GCTTGGGCAC TTCAGTTAGG ACCTAAGGAT  480
GCCAGCCGGC AGGTTTATAT ATGCAGCAAC AATATTCAAG CGCGACAACA GGTTATTGAA  540
CTTGCCCGCC AGTTGAATTT CATTCCCATT GACTTGGGAT CCTTATCATC AGCCAGAGAG  600
ATTGAAAATT TACCCCTACG ACTCTTTACT CTCTGGAGAG GGCCAGTGGT GGTAGCTATA  660
AGCTTGGCCA CATTTTTTTT CCTTTATTCC TTTGTCAGAG ATGTGATTCA TCCATATGCT  720
AGAAACCAAC AGAGTGACTT TTACAAAATT CCTATAGAGA TTGTGAATAA AACCTTACCT  780
ATAGTTGCCA TTACTTTGCT CTCCCTAGTA TACCTCGCAG GTCTTCTGGC AGCTGCTTAT  840
CAACTTTATT ACGGCACCAA GTATAGGAGA TTTCCACCTT GGTTGGAAAC CTGGTTACAG  900
TGTAGAAAAC AGCTTGGATT ACTAAGTTTT TTCTTCGCTA TGGTCCATGT TGCCTACAGC  960
CTCTGCTTAC CGATGAGAAG GTCAGAGAGA TATTTGTTTC TCAACATGGC TTATCAGCAG 1020
GTTCATGCAA ATATTGAAAA CTCTTGGAAT GAGGAAGAAG TTTGGAGAAT TGAAATGTAT 1080
ATCTCCTTTG GCATAATGAG CCTTGGCTTA CTTTCCCTCC TGGCAGTCAC TTCTATCCCT 1140
TCAGTGAGCA ATGCTTTAAA CTGGAGAGAA TTCAGTTTTA TTCAGTCTAC ACTTGGATAT 1200
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GTCGCTCTGC TCATAAGTAC TTTCCATGTT TTAATTTATG GATGGAAACG AGCTTTTGAG  1260
GAAGAGTACT ACAGATTTTA TACACCACCA AACTTTGTTC TTGCTCTTGT TTTGCCCTCA  1320
ATTGTAATTC TGGATCTTTT GCAGCTTTGC AGATACCCAG ACTGA
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SEQ ID NO:272 PBQ4 Protein sequence:
Protein Accession #: none

```
1          11         21         31         41         51
|          |          |          |          |          |
MESISMMGSP KSLSETCLPN GINGIKDARK VTVGVIGSGD FAKSLTIRLI RCGYHVVIGS    60
RNPKFASEFF PHVVDVTHHE DALTKTNIIF VAIHREHYTS LWDLRHLLVG KILIDVSNNM   120
RINQYPESNA EYLASLFPDS LIVKGFNVVS AWALQLGPKD ASRQVYICSN NIQARQQVIE   180
LARQLNFIPI DLGSLSSARE IENLPLRLFT LWRGPVVVAI SLATFFFLYS FVRDVIHPYA   240
RNQQSDFYKI PIEIVNKTLP IVAITLLSLV YLAGLLAAAY QLYYGTKYRR FPPWLETWLQ   300
CRKQLGLLSF FFAMVHVAYS LCLPMRRSER YLFLNMAYQQ VHANIENSWN EEEVWRIEMY   360
ISFGIMSLGL LSLLAVTSIP SVSNALNWRE FSFIQSTLGY VALLISTFHV LIYGWKRAFE   420
EEYYRFYTPP NFVLALVLPS IVILDLLQLC RYPD
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SEQ ID NO:273 PBQ5 DNA SEQUENCE

Nucleic Acid Accession#: NM_001973
Coding sequence: 150-1445 (underlined sequence corresponds to start and stop codon)

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1          11         21         31         41         51
|          |          |          |          |          |
CCGCCGCCTT CTACTCCGCC GCGGGGGTCG CAGCGGCTGC CGCGCCGTCC TCGAGTTTCC    60
AGCGTGAGGA GGAGGCTGAG GGCGGAGAGG CGCATCGTGT TCGAGGCGGA GACCGAGGGG   120
GAGCCCCGCG CGCGGCGTCG CTCATTGCTA TGGACAGTGC TATCACCCTG TGGCAGTTCC   180
TTCTTCAGCT CCTGCAGAAG CCTCAGAACA AGCACATGAT CTGTTGGACC TCTAATGATG   240
GGCAGTTTAA GCTTTTGCAG GCAGAAGAGG TGGCTCGTCT CTGGGGGATT CGCAAGAACA   300
AGCCTAACAT GAATTATGAC AAACTCAGCC GAGCCCTCAG ATACTATTAT GTAAAGAATA   360
TCATCAAAAA AGTGAATGGT CAGAAGTTTG TGTACAAGTT TGTCTCTTAT CCAGAGATTT   420
TGAACATGGA TCCAATGACA GTGGGCAGGA TTGAGGGTGA CTGTGAAAGT TTAAACTTCA   480
GTGAAGTCAG CAGCAGTTCC AAAGATGTGG AGAATGGAGG GAAAGATAAA CCACCTCAGC   540
CTGGTGCCAA GACCTCTAGC CGCAATGACT ACATACACTC TGGCTTATAT TCTTCATTTA   600
CTCTCAACTC TTTGAACTCC TCCAATGTAA AGCTTTTCAA ATTGATAAAG ACTGAGAATC   660
CAGCCGAGAA ACTGGCAGAG AAAAAATCTC CTCAGGAGCC CACACCATCT GTCATCAAAT   720
TTGTCACGAC ACCTTCCAAA AAGCCACCAG TTGAACCTGT TGCTGCCACC ATTTCAATTG   780
GCCCAAGTAT TTCTCCATCT TCAGAAGAAA CTATCCAAGC TTTGGAGACA TTGGTTTCCC   '840
CAAAACTGCC TTCCCTGGAA GCCCCAACCT CTGCCTCTAA CGTAATGACT GCTTTTGCCA   900
CCACACCACC CATTTCGTCC ATACCCCCTT TGCAGGAACC TCCCAGAACA CCTTCACCAC   960
CACTGAGTTC TCACCCAGAC ATCGACACAG ACATTGATTC AGTGGCTTCT CAGCCAATGG  1020
AACTTCCAGA GAATTTGTCT CTGGAGCCTA AAGACCAGGA TTCAGTCTTG CTAGAAAAGG  1080
ACAAAGTAAA TAATTCATCA AGATCCAAGA AACCCAAAGG GTTAGGACTG GCACCCACCC  1140
TTGTGATCAC GAGCAGTGAT CCAAGCCCAC TGGGAATACT GAGCCCATCT CTCCCTACAG  1200
CTTCTCTTAC ACCAGCATTT TTTTCACAGA CACCCATCAT ACTGACTCCA AGCCCCTTGC  1260
TCTCCAGTAT CCACTTCTGG AGTACTCTCA GTCCTGTTGC TCCCCTAAGT CCAGCCAGAC  1320
TGCAAGGTGC TAACACACTT TTCCAGTTTC CTTCTGTACT GAACAGTCAT GGGCCATTCA  1380
CTCTGTCTGG GCTGGATGGA CCTTCCACCC CTGGCCCATT TTCCCCAGAC CTACAGAAGA  1440
CATAACCTAT GCACTTGTGG AATGAGAGAA CCGAGGAACG AAGAAACAGA CATTCAACAT  1500
GATTGCATTT GAAGTGAGCA ATTGATAGTT CTACAATGCT GATAATAGAC TATTGTGATT  1560
TTTGCCATTC CCCATTGAAA ACATCTTTTT AGGATTCTCT TTGAATAGGA CTCAAGTTGG  1620
ACTATATGTA TAAAAATGCC TTAATTGGAG TCTAAACTCC ACCTCCCTCT GTCTTTTCCT  1680
TTTCTTTTTC TTTCCTTCCT TCCTTTTCTT TTCTCCTTTA AAAATATTTT GAGCTTTGTG  1740
CTGAAGAAGT TTTTGGTGGG CTTTAGTGAC TGTGCTTTGC AAAAGCAATT AAGAACAAAG  1800
TTACTCCTTC TGGCTATTGG GACCCTTTGG CCAGGAAAAA TTATGCTTAG AATCTATTAT  1860
TTAAAGAAGT ATTTGTGAAA TGAAAAAAAA AAAAAAAAAA AAAAAAAAAA AAAAAAAAAA  1920
AAAAAAAAAA AAA
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SEQ ID NO:274 PBQ5 Protein sequence:
Protein Accession #: NP_001964

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MDSAITLWQF LLQLLQKPQN KHMICWTSND GQFKLLQAEE VARLWGIRKN KPNMNYDKLS   60
RALRYYYVKN IIKKVNGQKF VYKFVSYPEI LNMDPMTVGR IEGDCESLNF SEVSSSSKDV  120
ENGGKDKPPQ PGAKTSSRND YIHSGLYSSF TLNSLNSSNV KLFKLIKTEN PAEKLAEKKS  180
PQEPTPSVIK FVTTPSKKPP VEPVAATISI GPSISPSSEE TIQALETLVS PKLPSLEAPT  240
SASNVMTAFA TTPPISSIPP LQEPPRTPSP PLSSHPDIDT DIDSVASQPM ELPENLSLEP  300
KDQDSVLLEK DKVNNSSRSK KPKGLGLAPT LVITSSDPSP LGILSPSLPT ASLTPAFFSQ  360
TPIILTPSPL LSSIHFWSTL SPVAPLSPAR LQGANTLFQF PSVLNSHGPF TLSGLDGPST  420
PGPFSPDLQK T
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SEQ ID NO:275 PBY3 DNA SEQUENCE

Nucleic Acid Accession#: AB040921
Coding sequence: 131-2560 (underlined sequence corresponds to start and stop codon)

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|          |          |          |          |          |
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AATCAGGAAC AGATCATATA TTGACCGAGA TTCTGAGTAT CTCTTGCAAG AAAATGAACC   60
AGATGGAACT TTAGACCAAA AATTATTGGA AGATTTACAA AAGAAAAAAA ATGACCTTCG  120
GTATATTGAA ATGCAGCATT TCAGAGAAAA GCTGCCTTCG TATGGAATGC AAAAGGAATT  180
GGTAAATTTA ATTGATAACC ATCAGGTAAC AGTAATAAGT GGTGAAACTG GTTGTGGCAA  240
AACCACTCAA GTTACTCAGT TCATTTTGGA TAACTACATT GAAAGAGGAA AAGGATCTGC  300
TTGCAGAATA GTTTGTACTC AGCCAAGAAG AATTAGTGCC ATTTCAGTTG CGGAAAGAGT  360
AGCTGCAGAA AGGGCAGAAT CTTGTGGCAG TGGTAATAGT ACTGGATATC AAATTCGTCT  420
CCAGAGTCGG TTGCCAAGGA AACAGGGTTC TATCTTATAC TGTACAACAG GAATCATCCT  480
TCAGTGGCTC CAGTCAGACC CGTATTTGTC CAGTGTTAGT CATATCGTAC TTGATGAAAT  540
CCATGAAAGA AATCTGCAGT CAGATGTTTT AATGACTGTT GTTAAAGACC TTCTCAATTT  600
TCGATCTGAC TTGAAAGTAA TATTGATGAG TGCAACATTG AATGCAGAAA AGTTTTCAGA  660
ATATTTTGGT AACTGTCCAA TGATACATAT ACCTGGTTTT ACCTTTCCGG TTGTGGAATA  720
TCTTTTGGAA GATGTAATTG AAAAAATAAG GTATGTTCCA GAACAAAAAG AACACAGATC  780
CCAGTTTAAG AGGGGTTTCA TGCAAGGGCA TGTAAATAGA CAAGAAAAAG AAGAAAAAGA  840
AGCAATATAT AAAGAACGTT GGCCAGATTA TGTAAGGGAA CTGCGAAGAA GGTATTCTGC  900
AAGTACTGTA GATGTTATAG AAATGATGGA GGATGATAAA GTTGATCTGA ATTTGATTGT  960
TGCCCTCATC CGATACATTG TTTTGGAAGA AGAGGATGGT GCGATACTGG TCTTTCTGCC 1020
AGGCTGGGAC AATATCAGCA CTTTACATGA TCTCTTGATG TCACAAGTAA TGTTTAAATC 1080
AGATAAATTT TTAATTATAC CTTTACATTC ACTGATGCCT ACAGTTAACC AGACACAGGT 1140
GTTTAAAAGA ACCCCTCCTG GTGTTCGGAA AATAGTAATT GCTACCAACA TTGCGGAGAC 1200
TAGCATTACC ATAGATGATG TCGTTTATGT GATAGATGGA GGAAAAATAA AAGAGACGCA 1260
TTTTGATACT CAGAACAATA TCAGTACAAT GTCCGCTGAG TGGGTTAGTA AAGCTAATGC 1320
CAAACAGAGA AAAGGTCGAG CTGGAAGAGT TCAACCTGGT CATTGCTATC ATCTGTATAA 1380
TGGTCTTAGA GCAAGTCTTC TAGATGACTA TCAACTGCCA GAAATTTTGA GAACTCCTTT 1440
GGAAGAACTT TGTTTACAAA TAAAGATTTT AAGGCTAGGT GGAATTGCTT ATTTTCTGAG 1500
TAGATTAATG GACCCACCAT CAAATGAGGC AGTGTTACTC TCCATAAGAC ACCTGATGGA 1560
GCTGAACGCT TTGGATAAAC AAGAAGAATT GACACCTCTT GGAGTCCACT TGGCACGATT 1620
ACCCGTTGAG CCACATATTG GAAAAATGAT TCTTTTTGGA GCACTGTTCT GCTGCTTAGA 1680
CCCAGTACTC ACTATTGCTG CTAGTCTCAG TTTCAAAGAT CCATTTGTCA TTCCACTGGG 1740
AAAAGAAAAG ATTGCAGATG CAAGAAGAAA GGAATTGGCA AAGGATACTA GAAGTGATCA 1800
CTTAACAGTT GTGAATGCGT TTGAGGGCTG GGAAGAGGCT AGGCGACGTG GTTTCAGATA 1860
CGAAAAGGAC TATTGCTGGG AATATTTTCT GTCTTCAAAC ACACTGCAGA TGCTGCATAA 1920
CATGAAAGGA CAGTTTGCTG AGCATCTTCT TGGAGCTGGA TTTGTAAGCA GTAGAAATCC 1980
TAAAGATCCA GAATCTAATA TAAATTCAGA TAATGAGAAG ATAATTAAAG CTGTCATCTG 2040
TGCTGGTTTA TATCCCAAAG TTGCTAAAAT TCGACTAAAT TTGGGTAAAA AAAGAAAAAT 2100
GGTAAAAGTT TACACAAAAA CCGATGGCCT GGTTGCTGTT CATCCTAAAT CTGTTAATGT 2160
GGAGCAAACA GACTTTCACT ACAACTGGCT TATCTATCAC CTAAAGATGA GAACAAGCAG 2220
TATATACTTG TATGACTGCA CAGAGGTTTC CCCATACTGT CTCTTGTTTT TTGGAGGTGA 2280
CATTTCCATC CAGAAGGATA ACGATCAGGA AACTATTGCT GTAGATGAGT GGATTGTATT 2340
TCAGTCTCCA GCAAGAATTG CCCATCTTGT TAAGGAATTA AGAAAGGAAC TAGATATTCT 2400
TCTGCAAGAG AAGATTGAAA GTCCTCATCC TGTAGACTGG AATGACACTA AATCCAGAGA 2460
CTGTGCAGTA CTGTCAGCTA TTATAGACTT GATCAAAACA CAGGAAAAGG CAACTCCCAG 2520
GAACTTTCCG CCACGATTCC AGGATGGATA TTACAGCTGA CAGCTTTTCA GGGGTGGTCT 2580
GAAAAGCCAG TTTGACAGCC ATTCTTCATC ATTGTTTAAA TTTTGGCTGG ATGCCAAACC 2640
CTGGGACATG AACAATTTTC ATGTGTAAGG TAGAAGCCTT CAGTAGGTAG TAAAGACTTA 2700
ATGTGCATGA CTTGATGTTA TATGTAGAGA TATATATATA TATATATATA CCATAAAAGC 2760
AATATGTTCT CTGATCATAT ACTCTGCTGT GGTCATGCCC ACTCTTTGGG AGTATATTCC 2820
CTTTATATAT ATTGAGTATT GTACCACTTG AGAAATTCCT TTGTTCTGTT ATACAAAATT 2880
AATCTTTCTG CTCATAATGA TTGATGATAC CACCAGTAAA AATAGGATGT TTACCCCAAA 2940
ACAAGTGTCA ATTAAGAATT TGAACACAAC CACATTTTTT AAAATGAAAC TTCTATCGGA 3000
AGTAAATTAA TTTGTTGTAA TAAAGTCCAG TATTTAATAA AATGTACAAT GTTAAATCTC
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SEQ ID NO:276 PBY3 Protein sequence:
Protein Accession #: BAA96012

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IRNRSYIDRD SEYLLQENEP DGTLDQKLLE DLQKKKNDLR YIEMQHFREK LPSYGMQKEL   60
VNLIDNHQVT VISGETGCGK TTQVTQFILD NYIERGKGSA CRIVCTQPRR ISAISVAERV  120
AAERAESCGS GNSTGYQIRL QSRLPRKQGS ILYCTTGIIL QWLQSDPYLS SVSHIVLDEI  180
HERNLQSDVL MTVVKDLLNF RSDLKVILMS ATLNAEKFSE YFGNCPMIHI PGFTFPVVEY  240
LLEDVIEKIR YVPEQKEHRS QFKRGFMQGH VNRQEKEEKE AIYKERWPDY VRELRRRYSA  300
STVDVIEMME DDKVDLNLIV ALIRYIVLEE EDGAILVFLP GWDNISTLHD LLMSQVMFKS  360
DKFLIIPLHS LMPTVNQTQV FKRTPPGVRK IVIATNIAET SITIDDVVYV IDGGKIKETH  420
FDTQNNISTM SAEWVSKANA KQRKGRAGRV QPGHCYHLYN GLRASLLDDY QLPEILRTPL  480
EELCLQIKIL RLGGIAYFLS RLMDPPSNEA VLLSIRHLME LNALDKQEEL TPLGVHLARL  540
PVEPHIGKMI LFGALFCCLD PVLTIAASLS FKDPFVIPLG KEKIADARRK ELAKDTRSDH  600
LTVVNAFEGW EEARRRGFRY EKDYCWEYFL SSNTLQMLHN MKGQFAEHLL GAGFVSSRNP  660
KDPESNINSD NEKIIKAVIC AGLYPKVAKI RLNLGKKRKM VKVYTKTDGL VAVHPKSVNV  720
EQTDFHYNWL IYHLKMRTSS IYLYDCTEVS PYCLLFFGGD ISIQKDNDQE TIAVDEWIVF  780
QSPARIAHLV KELRKELDIL LQEKIESPHP VDWNDTKSRD CAVLSAIIDL IKTQEKATPR  840
NFPPRFQDGY YS
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SEQ ID NO:277 PBY6 DNA SEQUENCE

Nucleic Acid Accession#: AA464018
Coding sequence: 64-1669(underlined sequence corresponds to start and stop codon)

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GATTTTATCC TGGAACATTA CAGTGAAGAT GGCTATTTAT ATGAAGATGA AATTGCAGAT   60
CTTATGGATC TGAGACAAGC TTGTCGGACG CCTAGCCGGG ATGAGGCCGG GGTGGAACTG  120
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CTGATGACAT ACTTCATCCA GCTGGGCTTT GTCGAGAGTC GATTCTTCCC GCCCACACGG 180
CAGATGGGAC TCCTGTTCAC CTGGTATGAC TCTCTCACCG GGGTTCCGGT CAGCCAGCAG 240
AACCTGCTGC TGGAGAAGGC CAGTGTCCTG TTCAACACTG GGGCCCTCTA CACCCAGATT 300
GGGACCCGGT GTGATCGGCA GACGCAGGCT GGGCTGGAGA GTGCCATAGA TGCCTTTCAG 360
AGAGCCGCAG GGGTTTTAAA TTACCTGAAA GACACATTTA CCCATACTCC AAGTTACGAC 420
ATGAGCCCTG CCATGCTCAG CGTGCTCGTC AAAATGATGC TTGCACAAGC CCAAGAAAGC 480
GTGTTTGAGA AAATCAGCCT TCCTGGGATC CGGAATGAAT TCTTCATGCT GGTGAAGGTG 540
GCTCAGGAGG CTGCTAAGGT GGGAGAGGTC TACCAACAGC TACACGCAGC CATGAGCCAG 600
GCGCCGGTGA AAGAGAACAT CCCCTACTCC TGGGCCAGCT TAGCCTGCGT GAAGGCCCAC 660
CACTACGCGG CCCTGGCCCA CTACTTCACT GCCATCCTCC TCATCGACCA CCAGGTGAAG 720
CCAGGCACGG ATCTGGACCA CCAGGAGAAG TGCCTGTCCC AGCTCTACGA CCACATGCCA 780
GAGGGGCTGA CACCCTTGGC CACACTGAAG AATGATCAGC AGCGCCGACA GCTGGGGAAG 840
TCCCACTTGC GCAGAGCCAT GGCTCATCAC GAGGAGTCGG TGCGGGAGGC CAGCCTCTGC 900
AAGAAGCTGC GGAGCATTGA GGTGCTACAG AAGGTGCTGT GTGCCGCACA GGAACGCTCC 960
CGGCTCACGT ACGCCCAGCA CCAGGAGGAG GATGACCTGC TGAACCTGAT CGACGCCCCC 1020
AGTGTTGTTG CTAAAACTGA GCAAGAGGTT GACATTATAT TGCCCCAGTT CTCCAAGCTG 1080
ACAGTCACGG ACTTCTTCCA GAAGCTGGGC CCCTTATCTG TGTTTTCGGC TAACAAGCGG 1140
TGGACGCCTC CTCGAAGCAT CCGCTTCACT GCAGAAGAAG GGGACTTGGG GTTCACCTTG 1200
AGAGGGAACG CCCCCGTTCA GGTTCACTTC CTGGATCCTT ACTGCTCTGC CTCGGTGGCA 1260
GGAGCCCGGG AAGGAGATTA TATTGTCTCC ATTCAGCTTG TGGATTGTAA GTGGCTGACG 1320
CTGAGTGAGG TTATGAAGCT GCTGAAGAGC TTTGGCGAGG ACGAGATCGA GATGAAAGTC 1380
GTGAGCCTCC TGGACTCCAC ATCATCCATG CATAATAAGA GTGCCACATA CTCCGTGGGA 1440
ATGCAGAAAA CGTACTCCAT GATCTGCTTA GCCATTGATG ATGACGACAA AACTGATAAA 1500
ACCAAGAAAA TCTCCAAGAA GCTTTCCTTC CTGAGTTGGG GCACCAACAA GAACAGACAG 1560
AAGTCAGCCA GCACCTTGTG CCTCCCATCG GTCGGGGCTG CACGGCCTCA GGTCAAGAAG 1620
AAGCTGCCCT CCCCTTTCAG CCTTCTCAAC TCAGACAGTT CTTGGTACTA A

SEQ ID NO:278 PBY6 Protein sequence:
Protein Accession #: NP_149094

DFILEHYSED GYLYEDEIAD LMDLRQACRT PSRDEAGVEL LMTYFIQLGF VESRFFPPTR 60
QMGLLFTWYD SLTGVPVSQQ NLLLEKASVL FNTGALYTQI GTRCDRQTQA GLESAIDAFQ 120
RAAGVLNYLK DTFTHTPSYD MSPAMLSVLV KMMLAQAQES VFEKISLPGI RNEFFMLVKV 180
AQEAAKVGEV YQQLHAAMSQ APVKENIPYS WASLACVKAH HYAALAHYFT AILLIDHQVK 240
PGTDLDHQEK CLSQLYDHMP EGLTPLATLK NDQQRRQLGK SHLRRAMAHH EESVREASLC 300
KKLRSIEVLQ KVLCAAQERS RLTYAQHQEE DDLLNLIDAP SVVAKTEQEV DIILPQFSKL 360
TVTDFFQKLG PLSVFSANKR WTPPRSIRFT AEEGDLGFTL RGNAPVQVHF LDPYCSASVA 420
GAREGDYIVS IQLVDCKWLT LSEVMKLLKS FGEDEIEMKV VSLLDSTSSM HNKSATYSVG 480
MQKTYSMICL AIDDDDKTDK TKKISKKLSF LSWGTNKNRQ KSASTLCLPS VGAARPQVKK 540
KLPSPFSLLN SDSSWY

SEQ ID NO:279 PBY8 DNA SEQUENCE

Nucleic Acid Accession#: AF107493
Coding sequence: 125-556 (underlined sequence corresponds to start and stop codon)

1 11 21 31 41 51

GAATTCGGCA CGAGCCTTGT TGGAGGTTCT GGGGCGCAGA ACCGCTACTG CTGCTTCGGT 60
CTCTCCTTGG GAAAAAATAA AATTTGAACC TTTTGGAGCT GTGTGCTAAA TCTTCAGTGG 120
GACAATGGGT TCAGACAAAA GAGTGAGTAG AACAGAGCGT AGTGGAAGAT ACGGTTCCAT 180
CATAGACAGG GATGACCGTG ATGAGCGTGA ATCCCGAAGC AGGCGGAGGG ACTCAGATTA 240
CAAAAGATCT AGTGATGATC GGAGGGGTGA TAGATATGAT GACTACCGAG ACTATGACAG 300
TCCAGAGAGA GAGCGTGAAA GAAGGAACAG TGACCGATCC GAAGATGGCT ACCATTCAGA 360
TGGTGACTAT GGTGAGCACG ACTATAGGCA TGACATCAGT GACGAGAGGG AGAGCAAGAC 420
CATCATGCTG CGCGGCCTTC CCATCACCAT CACAGAGAGC GATATTCGAG AAATGATGGA 480
GTCCTTCGAA GGCCCTCAGC CTGCGGATGT GAGGCTGATG AAGAGGAAAA CAGGTGAGAG 540
CTTGCTTAGT TCCTGATATT ATTGTTCTCT TCCCCATTCC CACCTCAGTC CCTAAAGAAC 600
ATCCTGATTC CCCCAGTCTT CAAGCACATG AATTCAGAAT GAAAGGTTTG CCATGGCTAA 660
GGAATGTGAC TCTTTGAAAA CCATGTTAGC ATCTGAGGAA CTTTTTTAAA CTTTGTTTTA 720
GGGACTTTTT TTTCCTTAGG TAAGTAATGA TTTATAAACT CCTTTTTTTT TTTGACTATA 780
GTCGGTTGCA TGGTTACTTT AAGCGTGGAA TCAAATGGAG TGGCATTTAG TTCAGGCGGC 840
TTGTTCCTTG CCATGGCAAA GTATCAAGAA GATCCCCAAG TCAAGTCACA TTTGTAAAGC 900
TGCTTCCCAA TTGGCTTTGT CACGCAGTGT TGAAGCAGTG GGAGAGAGAT TCACCTGTTA 960
TAAAGGAACT GACTAACACA AGTATCCCGT CTATATCTGA ATGCTGTCTC TAGGTGTAAG 1020
CCGTGGTTTC GCCTTCGTGG AGTTTTATCA CTTGCAAGAT GCTACCAGCT GGATGGAAGC 1080
CAATCAGGTT GCTTCACTCA CCAAGTCTAG ATATTCATGA AAATGGAACA AGTCTGTACA 1140
ATTTTAAAAA AAGGTTGAAG GAGTGGTTTG TTCCAAAGGA GTGACTTTTT TTTAAAAAAA 1200
AAGCTTTGTA TATATTAAAA TTGATGTTAC TAGAATAAGT ACAGTACCAA GGACTTCATT 1260
ATAGAATTTG TTCTGCCTTT AAACATGGCT ACCTACCTGG CAGGGCTTTG TTAACTACTG 1320
AATACCTGTC TGGTAATCAC TAAAACATCT TTATGTTTCC CTTTTTTCTA GTTTGTTATA 1380
TTCCTATTAT GTCCATTGAG AGTAAGCTTA GTATATCAAA CTCTCCATTT GACAGTGAAG 1440
AGAACATAGT GAAAGTCTGT GGCGGCATTT TTATAAGTAA TTCCTTATTT CTGCCTGAAG 1500
ACCACAAAGC CTCCTGGAGG CGTAACTGCT CAGACCGGTC TTCAGGGAAT ATTTAAGGAC 1560
TTAGTGGAAT TTATGAACAA TAAGTCTGAT GAGATTAGCC TGGGAGTGGT GTCCTGCAGC 1620
TGTCTAATCT AGAGTGGCAT TAACATTCTA ATCTCCTTGA GAATGCCTTT TATAGTCTGT 1680
TCAAAGCAAG TCATTGATGG TTCTTCGAGG TAGTGTTAAC TGAAGTGTTC TTCAGTTTGT 1740
CAAGATAATG TTCAGTGCTT GGCACTTAAA TAACATTTTT TGCAAGAACT CCAAGGCACA 1800

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TTATTGAATG CCTTTAACCA AGTGCATTCT GGGAAGTTTG CTTGACTCAT TATCTTGCTT  1860
TTCTGCAGCA TTCTGTGATT TGAGTCATCC ATGAATCCAT GAATAAAAGT TACATTCTTT  1920
GATTGGTAAT ATTGCCATTT ATAACAAGAC TCACTAATGA GGGTATCACT TTGACTGACT  1980
GATTTGTTAA AGTTTTTAAG CCTCTCATTT TCCTAACCCA GAAATCACAG CCTGATTTTA  2040
TTAAAAGTAG AGCTTCATTC ATTTCATACC ATAGATACCA TCCTAGTAAA TCCAGAACAT  2100
ATACAAGGTT CATGTGAGTC TGCTTTCTTG ACATGATAGC ATTGTTTGAT GCAGTGGATA  2160
TGTCAGAATG ACTAACCTAG GAGTTTGAAA CTCCTAAGAA ACTAAAACCT GTAAGACATT  2220
TAAAAGTCTC CACAATTTTA ATGTATACAA AGCTATGTTA CTGTGTAACA CATTACAGTT  2280
CAAATTCACT CCAGAAATAA AAGGCCAGTA GGATTAGGGA CTCACTGGTA GTTTGGAGTC  2340
TCCCAGCACA CATCCCTCCT AGTGGGATGA TCTATTCACA TATCTCCCAG CTTTTTTATT  2400
TTTGCTTCTG TATATCACAG TGAGTGGATG GCCCTTCAGC TTTTTCTCTC CTGGCCAGAC  2460
ATGCAGTCTT GCCTTTAGAT ATCGCAGAGA CAAAATTCAC AGCATGTCTT AAATCTTCCA  2520
GGATTTGCAA GAACCAAATT GCTCAACAGT ATGTATGTTT AGAGGGGTTA GACTCCTTTT  2580
TAAAATCTGG ATATCTAACC ACCTACTTAA ATCTGTTTGA TAGTGTCAAA CCACCCCCAC  2640
CCTTGATCCT CCCACCCCCA AAAAAAAAAA AAAA
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SEQ ID NO:280 PBY8 Protein sequence:
Protein Accession #: XP_003261

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MGSDKRVSRT ERSGRYGSII DRDDRDERES RSRRRDSDYK RSSDDRRGDR YDDYRDYDSP  60
ERERERRNSD RSEDGYHSDG DYGEHDYRHD ISDERESKTI MLRGLPITIT ESDIREMMES  120
FEGPQPADVR LMKRKTGESL LSS
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SEQ ID NO:281 PCI2 DNA SEQUENCE

Nucleic Acid Accession#: AF208291
Coding sequence: 109-3705 (underlined sequence corresponds to start and stop codon)

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CGGCCGCTTT TTTCTCAAGA TGGCAGATTC CCACTGAGGC TGAGGGGGCC GAGCTCGCGC    60
GCCGCGTTCC CTTCTCCGTT GCCATGAACC GCGGACACCC CGGCCCCGAT GGCCCCCGTG   120
TACGAAGGTA TGGCCTCACA TGTGCAAGTT TTCTCCCCTC ACACCCTTCA ATCAAGTGCC   180
TTCTGTAGTG TGAAGAAACT AAAAGTAGAG CCAAGTTCCA ACTGGGACAT GACTGGGTAC   240
GGCTCCCACA GCAAAGTGTA CAGCCAGAGC AAGAACATAC CACCTTCTCA GCCAGCCTCC   300
ACAACCGTCA GCACCTCCTT GCCGGTCCCA AACCCAAGCC TACCTTACGA GCAGACCATC   360
GTCTTCCCAG GAAGCACCGG GCACATCGTG GTCACCTCAG CAAGCAGCAC TTCTGTCACC   420
GGGCAAGTCC TCGGCGGACC ACACAACCTA ATGCGTCGAA GCACTGTGAG CCTCCTTGAT   480
ACCTACCAAA AATGTGGACT CAAGCGTAAG AGCGAGGAGA TCGAGAACAC AAGCAGCGTG   540
CAGATCATCG AGGAGCATCC ACCCATGATT CAGAATAATG CAAGCGGGGC CACTGTCGCC   600
ACTGCCACCA CGTCTACTGC CACCTCCAAA AACAGCGGCT CCAACAGCGA GGGCGACTAT   660
CAGCTGGTGC AGCATGAGGT GCTGTGCTCC ATGACCAACA CCTACGAGGT CTTAGAGTTC   720
TTGGGCCGAG GGACGTTTGG ACAAGTGGTC AAGTGCTGGA AACGGGGCAC CAATGAGATC   780
GTAGCCATCA AGATCCTGAA GAACCGCCCA TCCTATGCCC GACAAGGTCA GATTGAAGTG   840
AGCATCCTGG CCCGGTTGAG CACGGAGAGT GCCGATGACT ATAACTTCGT CCGGGCCTAC   900
GAATGCTTCC AGCACAAGAA CCACACGTGC TTGGTCTTCG AGATGTTGGA GCAGAACCTC   960
TATGACTTTC TGAAGCAAAA CAAGTTTAGC CCCTTGCCCC TCAAATACAT TCGCCCAGTT  1020
CTCCAGCAGG TAGCCACAGC CCTGATGAAA CTCAAAAGCC TAGGTCTTAT CCACGCTGAC  1080
CTCAAACCAG AAAACATCAT GCTGGTGGAT CCATCTAGAC AACCATACAG AGTCAAGGTC  1140
ATCGACTTTG GTTCAGCCAG CCACGTCTCC AAGGCTGTGT GCTCCACCTA CTTGCAGTCC  1200
AGATATTACA GGGCCCCTGA GATCATCCTT GGTTTACCAT TTTGTGAGGC AATTGACATG  1260
TGGTCCCTGG GCTGTGTTAT TGCAGAATTG TTCCTGGGTT GGCCGTTATA TCCAGGAGCT  1320
TCGGAGTATG ATCAGATTCG GTATATTTCA CAAACACAGG GTTTGCCTGC TGAATATTTA  1380
TTAAGCGCCG GGACAAAGAC AACTAGGTTT TTCAACCGTG ACACGGACTC ACCATATCCT  1440
TTGTGGAGAC TGAAGACACC AGATGACCAT GAAGCAGAGA CAGGGATTAA GTCAAAAGAA  1500
GCAAGAAAGT ACATTTTCAA CTGTTTAGAT GATATGGCCC AGGTGAACAT GACGACAGAT  1560
TTGGAAGGGA GCGACATGTT GGTAGAAAAG GCTGACCGGC GGGAGTTCAT TGACCTGTTG  1620
AAGAAGATGC TGACCATTGA TGCTGACAAG AGAATCACTC CAATCGAAAC CCTGAACCAT  1680
CCCTTTGTCA CCATGACACA CTTACTCGAT TTTCCCCACA GCACACACGT CAAATCATGT  1740
TTCCAGAACA TGGAGATCTG CAAGCGTCGG GTGAATATGT ATGACACGGT GAACCAGAGC  1800
AAAACCCCTT TCATCACGCA CGTGGCCCCC AGCACGTCCA CCAACCTGAC CATGACCTTT  1860
AACAACCAGC TGACCACTGT CCACAACCAG GCTCCCTCCT CTACCAGTGC CACTATTTCC  1920
TTAGCCAATC CCGAAGTCTC CATACTAAAC TACCCATCTA CACTCTACCA GCCCTCAGCG  1980
GCATCCATGG CTGCAGTGGC CCAGCGGAGC ATGCCCCTGC AGACAGGAAC AGCCCAGATT  2040
TGTGCCCGGC CTGACCCGTT CCAGCAAGCT CTCATCGTGT GTCCCCCCGG CTTCCAAGGC  2100
TTGCAGGCCT CTCCCTCTAA GCACGCTGGC TACTCGGTGC GAATGGAAAA TGCAGTTCCC  2160
ATCGTCACTC AAGCCCCAGG AGCTCAGCCT CTTCAGATCC AACCAGGTCT GCTTGCCCAG  2220
CAGGCTTGGC CAAGTGGGAC CCAGCAGATC CTGCTTCCCC CAGCATGGCA GCAACTGACT  2280
GGAGTGGCCA CCCACACATC AGTGCAGCAT GCCACCGTGA TTCCCGAGAC CATGGCAGGC  2340
ACCCAGCAGC TGGCGGACTG GAGAAATACG CATGCTCACG GAAGCCATTA TAATCCCATC  2400
ATGCAGCAGC CTGCACTATT GACCGGTCAT GTGACCCTTC CAGCAGCACA GCCCTTAAAT  2460
GTGGGTGTGG CCCACGTGAT GCGGCAGCAG CCAACCAGCA CCACCTCCTC CCGGAAGAGT  2520
AAGCAGCACC AGTCATCTGT GAGAAATGTC TCCACCTGTG AGGTGTCCTC CTCTCAGGCC  2580
ATCAGCTCCC CACAGCGATC CAAGCGTGTC AAGGAGAACA CACCTCCCCG CTGTGCCATG  2640
GTGCACAGTA GCCCGGCCTG CAGCACCTCG GTCACCTGTG GGTGGGGCGA CGTGGCCTCC  2700
AGCACCACCC GGGAACGGCA GCGGCAGACA ATTGTCATTC CCGACACTCC CAGCCCCACG  2760
GTCAGCGTCA TCACCATCAG CAGTGACACG GACGAGGAGG AGGAACAGAA ACACGCCCCC  2820
ACCAGCACTG TCTCCAAGCA AAGAAAAAAC GTCATCAGCT GTGTCACAGT CCACGACTCC  2880
CCCTACTCCG ACTCCTCCAG CAACACCAGC CCCTACTCCG TGCAGCAGCG TGCTGGGCAC  2940
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AACAATGCCA ATGCCTTTGA CACCAAGGGG AGCCTGGAGA ATCACTGCAC GGGGAACCCC  3000
CGAACCATCA TCGTGCCACC CCTGAAAACC CAGGCCAGCG AAGTATTGGT GGAGTGTGAT  3060
AGCCTGGTGC CAGTCAACAC CAGTCACCAC TCGTCCTCCT ACAAGTCCAA GTCCTCCAGC  3120
AACGTGACCT CCACCAGCGG TCACTCTTCA GGGAGCTCAT CTGGAGCCAT CACCTACCGG  3180
CAGCAGCGGC CGGGCCCCCA CTTCCAGCAG CAGCAGCCAC TCAATCTCAG CCAGGCTCAG  3240
CAGCACATCA CCACGGACCG CACTGGGAGC CACCGAAGGC AGCAGGCCTA CATCACTCCC  3300
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CCTGGGACCG TGGGCGCTGG CCTTTTATAC TGAAGATGCC GCACACAAAC AATGCAAACG  3840
GGGCAGGGGC GGGGGGGGGG GGGGCAGAGG GCAGGGGGAC GGGTCGGGAC ACCAGTGAAA  3900
CTTGAACCGG GAAGTGGGAG GACGTAGAGC AGAGAAGAGA ACATTTTTAA AAGGAAGGGA  3960
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SEQ ID NO:282 PCI2 Protein sequence:
Protein Accession #: NP_073577

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SLLDTYQKCG LKRKSEEIEN TSSVQIIEEH PPMIQNNASG ATVATATTST ATSKNSGSNS  180
EGDYQLVQHE VLCSMTNTYE VLEFLGRGTF GQVVKCWKRG TNEIVAIKIL KNRPSYARQG  240
QIEVSILARL STESADDYNF VRAYECFQHK NHTCLVFEML EQNLYDFLKQ NKFSPLPLKY  300
IRPVLQQVAT ALMKLKSLGL IHADLKPENI MLVDPSRQPY RVKVIDFGSA SHVSKAVCST  360
YLQSRYYRAP EIILGLPFCE AIDMWSLGCV IAELFLGWPL YPGASEYDQI RYISQTQGLP  420
AEYLLSAGTK TTRFFNRDTD SPYPLWRLKT PDDHEAETGI KSKEARKYIF NCLDDMAQVN  480
MTTDLEGSDM LVEKADRREF IDLLKKMLTI DADKRITPIE TLNHPFVTMT HLLDFPHSTH  540
VKSCFQNMEI CKRRVNMYDT VNQSKTPFIT HVAPSTSTNL TMTFNNQLTT VHNQAPSSTS  600
ATISLANPEV SILNYPSTLY QPSAASMAAV AQRSMPLQTG TAQICARPDP FQQALIVCPP  660
GFQGLQASPS KHAGYSVRME NAVPIVTQAP GAQPLQIQPG LLAQQAWPSG TQQILLPPAW  720
QQLTGVATHT SVQHATVIPE TMAGTQQLAD WRNTHAHGSH YNPIMQQPAL LTGHVTLPAA  780
QPLNVGVAHV MRQQPTSTTS SRKSKQHQSS VRNVSTCEVS SSQAISSPQR SKRVKENTPP  840
RCAMVHSSPA CSTSVTCGWG DVASSTTRER QRQTIVIPDT PSPTVSVITI SSDTDEEEEQ  900
KHAPTSTVSK QRKNVISCVT VHDSPYSDSS SNTSPYSVQQ RAGHNNANAF DTKGSLENHC  960
TGNPRTIIVP PLKTQASEVL VECDSLVPVN TSHHSSSYKS KSSSNVTSTS GHSSGSSSGA  1020
ITYRQQRPGP HFQQQQPLNL SQAQQHITTD RTGSHRRQQA YITPTMAQAP YSFPHNSPSH  1080
GTVHPHLAAA AAAHLPTQP HLYTYTAPAA LGSTGTVAHL VASQGSARHT VQHTAYPASI  1140
VHQVPVSMGP RVLPSPTIHP SQYPAQFAHQ TYISASPAST VYTGYPLSPA KVNQYPYI
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SEQ ID NO:283 PBY1 DNA SEQUENCE

Nucleic Acid Accession#: NM_017700
Coding sequence: 147-806 (underlined sequence corresponds to start and stop codon)

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TCACTCTAGT AGCTTTAACC CTCACCCTGA GGCACCTTAG CAATCAGCCA TTGCCTGCAA   120
GCCTCCAAAG CTTGTCTTTG CCTAATATGG AGCCCAAAGA AGCCACTGGG AAAGAAAACA   180
TGGTCACCAA GAAAAAGAAT CTGGCCTTCT TGAGGTCTAG ACTCTATATG CTGGAGAGAA   240
GGAAGACTGA CACTGTGGTT GAGAGCAGTG TTTCTGGGGA CCACTCTGGC ACCTTGAGGA   300
GGAGCCAATC TGACAGGACC GAATACAACC AGAAATTACA AGAAAAGATG ACTCCACAGG   360
GTGAGTGTTC TGTAGCTGAG ACCTTAACCC CAGAGGAAGA GCATCATATG AAGAGGATGA   420
TGGCAAAGCG GGAAAAGATC ATTAAGGAGC TGATACAGAC AGAAAAGGAT TATCTCAATG   480
ATCTAGAGCT GTGTGTTAGG GAAGTGGTTC AGCCCCTGAG AAATAAAAAG ACTGATAGGC   540
TGGATGTGGA TAGCTTGTTT AGCAACATTG AGTCCGTGCA TCAGATATCA GCCAAGCTGC   600
TGTCATTGTT GGAAGAGGCC ACAACAGACG TGGAACCGGC CATGCAAGTA ATTGGAGAAG   660
TATTCTTGCA GATTAAAGGG CCACTGGAAG ATATTTATAA AATCTACTGC TATCACCATG   720
ATGAAGCACA TAGTATACTG GAGTCCTATG AAAAGGAAGA AGAGCTGAAG GAACATTTGA   780
GCCACTGTAT CCAGTCCTTA AAGTAAGGCC TTTTCAAATG ATGATTCCCA TCTCCTCTCA   840
GTTGCCTAGC AGGGAACATT TTAAATGGAT GTAGATGAAA GGTCTCACAT AAATCCTATG   900
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GAAGCCCTGA TTGACTTTTT TTCCCCCTGC GAGAATGACT AAAAATAACA TGGAAGAAGA  1020
TTTAGAGCTC TGCAGCGATT GAAAAATGCA ATATCAAAAT ATAAAATGTG GAAGAAAAGC  1080
CTCTTCTTAA AGCTATTGTA ACTTGCCTGG CCCCACGTAG TTCAAGGATT ATGTGAGATA  1140
ACACGTGGCC CCATGACCAC TGGAGCACAT GGGTTAATGG AGTTAGGGGA ATGGCCTACA  1200
ACTCTGCATG GCCGTCTTCT TTCCCCAAAC TCACTGTGGG GAGATGGGTG AAGACAAGTC  1260
AGGCCTTGTT AAAGTTAGTT TCAGAACAAT TACTCATGCC TTCCTTTCTC ATCCCTAAAA  1320
CATTGGTGGG GGAGCTACAC AATGTACTTT TTCTTTTCTA GAGGAAGTAT CTATTCACTG  1380
TGAAAATCTG AAAAATATAA CAAAGTATGT GTAAGATAAA AACCCCTTGC TATTTCAAAA  1440
AAAAAAAAAA AAAAAAAAAA AAAA
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SEQ ID NO:284 PBY1 Protein sequence:
Protein Accession #: NP_060170

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1          11         21         31         41         51
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| | | | | |
MEPKEATGKE NMVTKKKNLA FLRSRLYMLE RRKTDTVVES SVSGDHSGTL RRSQSDRTEY 60
NQKLQEKMTP QGECSVAETL TPEEEHHMKR MMAKREKIIK ELIQTEKDYL NDLELCVREV 120
VQPLRNKKTD RLDVDSLFSN IESVHQISAK LLSLLEEATT DVEPAMQVIG EVFLQIKGPL 180
EDIYKIYCYH HDEAHSILES YEKEEELKEH LSHCIQSLK

SEQ ID NO:285 PBQ9 DNA SEQUENCE

Nucleic Acid Accession#: X68534
Coding sequence: 523-2676 (underlined sequence corresponds to start and stop codon)

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TTCCTACACT TTTCCTGCGC TAGAGCAGCG AGCAGCCTGG AACAGACCCA GGCGGAGGAC 180
ACCTGTGGGG GAGGGAGCGC CTGGAGGAGC TTAGAGACCC CAGCCGGGCG TGATCTCACC 240
ATGTGCGGAT TTGCGAGGCG CGCCCTGGAG CTGCTAGAGA TCCGGAAGCA CAGCCCCGAG 300
GTGTGCGAAG CCACCAAGAC TGCGGCTCTT GGAGAAAGCG TGAGCAGGGG GCCACCGCGG 360
TCTCCGGCCT GTCTGCACCC TGTCGCCTGA GCTGCCTGAC AGTGACAATG ACATCCCAGT 420
TACCAGTGTC CTTGAATTGA TAGTGGCTTC TGTTTGTCAG TCTCATATAA GAACTACAGC 480
TCATCAGGAG GAGATCGCAG CAGGGTAAGA GACACCAACA CC<u>ATG</u>TTCTG CACGAAGCTC 540
AAGGATCTCA AGATCACAGG AGAGTGTCCT TTCTCCTTAC TGGCACCAGG TCAAGTTCCT 600
AACGAGTCTT CAGAGGAGGC AGCAGGAAGC TCAGAGAGCT GCAAAGCAAC CGTGCCCATC 660
TGTCAAGACA TTCCTGAGAA GAACATACAA GAAAGTCTTC CTCAAAGAAA AACCAGTCGG 720
AGCCGAGTCT ATCTTCACAC TTTGGCAGAG AGTATTTGCA AACTGATTTT CCCAGAGTTT 780
GAACGGCTGA ATGTTGCACT TCAGAGAACA TTGGCAAAGC ACAAAATAAA AGAAAGCAGG 840
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CCAGTGGAGT TATCAAAGAA TCTCTTGGTG AAGAGGTTTT TAAAATATGT TACGAGGAAG 960
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CCTTCTGAAA CAGAGCAGCC ATTGCCAAGA AGCAGGAAAA AGGGGCAGCT TGAGGACGCC 1080
TCCATTCTAT GCCTGGATAA GGAGGATGAT TTTCTACATG TTTACTACTT CTTCCCTAAG 1140
AGAACCACCT CCCTGATTCT TCCCGGCATC ATAAAGGCAG CTGCTCACGT ATTATATGAA 1200
ACGGAAGTGG AAGTGTCGTT AATGCCTCCC TGCTTCCATA ATGATTGCAG CGAGTTTGTG 1260
AATCAGCCCT ACTTGTTGTA CTCCGTTCAC ATGAAAAGCA CCAAGCCATC CCTGTCCCCC 1320
AGCAAACCCC AGTCCTCGCT GGTGATTCCC ACATCGCTAT TCTGCAAGAC ATTTCCATTC 1380
CATTTCATGT TTGACAAAGA TATGACAATT CTGCAATTTG GCAATGGCAT CAGAAGGCTG 1440
ATGAACAGGA GAGACTTTCA AGGAAAGCCT AATTTTGAAT ACTTTGAAAT TCTGACTCCA 1500
AAAATCAACC AGACCTTTAG CGGGATCATG ACTATGTTGA ATATGCAGTT TGTTGTACGA 1560
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GGGAAGCTGA AGGCTACCCT TGAGCAAGCC CACCAAGCCC TGGAGGAGGA GAAGAAAAAG 1860
ACAGTAGACC TTCTGTGCTC CATATTTCCC TGTGAGGTTG CTCAGCAGCT GTGGCAAGGG 1920
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TTCACTGCCA TCTGCTCCCA GTGCTCACCG CTGCAGGTCA TCACCATGCT CAATGCACTG 2040
TACACTCGCT TCGACCAGCA GTGTGGAGAG CTGGATGTCT ACAAGGTGGA GACCATTGCG 2100
ATGCCTATTG TGTGGCTTGG GGGATTACAC AAAGAGAGTG ATACTCATGC TGTTCAGATA 2160
GCGCTGATGG CCCTGAAGAT GATGGAGCTC TCTGATGAAG TTATGTCTCC CCATGGAGAA 2220
CCTATCAAGA TGCGAATTGG ACTGCACTCT GGATCAGTTT TTGCTGGCGT CGTTGGAGTT 2280
AAAATGCCCC GTTACTGTCT TTTTGGAAAC AATGTCACTC TGGCTAACAA ATTTGAGTCC 2340
TGCAGTGTAC CACGAAAAAT CAATGTCAGC CCAACAACTT ACAGATTACT CAAAGACTGT 2400
CCTGGTTTCG TGTTTACCCC TCGATCAAGG GAGGAACTTC CACCAAACTT CCCTAGTGAA 2460
ATCCCCGGAA TCTGCCATTT TCTGGATGCT TACCAACAAG GAACAAACTC AAAACCATGC 2520
TTCCAAAAGA AAGATGTGGA AGATGCAAGC CAATTTTTTA GGCAAAGCAT CAGGAATAGA 2580
TTAGCAACCT ATATACCTAT TTATAAGTCT TTGGGGTTTG ACTCATTGAA GATGTGTAGA 2640
GCCTCTGAAA GCACTTTAGG GATTGTAGAT GGC<u>TAA</u>CAAG CAGTATTAAA ATTTCAGGAG 2700
CCAAGTCACA ATCTTTCTCC TGTTTAACAT GACAAAATGT ACTCACTTCA GTACTTCAGC 2760
TCTTCAAGAA AAAAAAAAAA ACCTTAAAAA GCTACTTTTG TGGGAGTATT TCTATTATAT 2820
AACCAGCACT TACTACCTGT ACTCAAAATT CAGCACCTTG TACATATATC AGATAATTGT 2880
AGTCAATTGT ACAAACTGAT GGAGTCACCT GCAATCTCAT ATCCTGGTGG AATGCCATGG 2940
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SEQ ID NO:286 <u>PBQ9 Protein sequence:</u>
Protein Accession #: Q02108

1 11 21 31 41 51
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MFCTKLKDLK ITGECPFSLL APGQVPNESS EEAAGSSESC KATVPICQDI PEKNIQESLP 60
QRKTSRSRVY LHTLAESICK LIFPEFERLN VALQRTLAKH KIKESRKSLE REDFEKTIAE 120
QAVAAGVPVE VIKESLGEEV FKICYEEDEN ILGVVGGTLK DFLNSFSTLL KQSSHCQEAG 180
KRGRLEDASI LCLDKEDDFL HVYYFFPKRT TSLILPGIIK AAAHVLYETE VEVSLMPPCF 240
HNDCSEFVNQ PYLLYSVHMK STKPSLSPSK PQSSLVIPTS LFCKTFPFHF MFDKDMTILQ 300
FGNGIRRLMN RRDFQGKPNF EEYFEILTPK INQTFSGIMT MLNMQFVVRV RRWDNSVKKS 360
SRVMDLKGQM IYIVESSAIL FLGSPCVDRL EDFTGRGLYL SDIPIHNALR DVVLIGEQAR 420
AQDGLKKRLG KLKATLEQAH QALEEEKKKT VDLLCSIFPC EVAQQLWQGQ VVQAKKFSNV 480
TMLFSDIVGF TAICSQCSPL QVITMLNALY TRFDQQCGEL DVYKVETIGD AYCVAGGLHK 540

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ESDTHAVQIA LMALKMMELS DEVMSPHGEP IKMRIGLHSG SVFAGVVGVK MPRYCLFGNN   600
VTLANKFESC SVPRKINVSP TTYRLLKDCP GFVFTPRSRE ELPPNFPSEI PGICHFLDAY.  660
QQGTNSKPCF QKKDVEDGNA NFLGKASGID
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SEQ ID NO:287 PFD2 DNA SEQUENCE

Nucleic Acid Accession#: NM_000720

Coding sequence: 119-6664 (underlined sequence corresponds to start and stop codon)

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CGCCTCAACG CCCAGCACAG TGCCCTGCAC ACAGTAGTCG CTCAATAAAT GTTCGTGGAT   120
GATGATGATG ATGATGATGA AAAAAATGCA GCATCAACGG CAGCAGCAAG CGGACCACGC   180
GAACGAGGCA AACTATGCAA GAGGCACCAG ACTTCCTCTT TCTGGTGAAG GACCAACTTC   240
TCAGCCGAAT AGCTCCAAGC AAACTGTCCT GTCTTGGCAA GCTGCAATCG ATGCTGCTAG   300
ACAGGCCAAG GCTGCCCAAA CTATGAGCAC CTCTGCACCC CCACCTGTAG GATCTCTCTC   360
CCAAAGAAAA CGTCAGCAAT ACGCCAAGAG CAAAAAACAG GGTAACTCGT CCAACAGCCG   420
ACCTGCCCGC GCCCTTTTCT GTTTATCACT CAATAACCCC ATCCGAAGAG CCTGCATTAG   480
TATAGTGGAA TGGAAACCAT TTGACATATT TATATTATTG GCTATTTTTG CCAATTGTGT   540
GGCCTTAGCT ATTTACATCC CATTCCCTGA AGATGATTCT AATTCAACAA ATCATAACTT   600
GGAAAAAGTA GAATATGCCT TCCTGATTAT TTTTACAGTC GAGACATTTT TGAAGATTAT   660
AGCGTATGGA TTATTGCTAC ATCCTAATGC TTATGTTAGG AATGGATGGA ATTTACTGGA   720
TTTTGTTATA GTAATAGTAG GATTGTTTAG TGTAATTTTG GAACAATTAA CCAAAGAAAC   780
AGAAGGCGGG AACCACTCAA GCGGCAAATC TGGAGGCTTT GATGTCAAAG CCCTCCGTGC   840
CTTTCGAGTG TTGCGACCAC TTCGACTAGT GTCAGGGGTG CCCAGTTTAC AAGTTGTCCT   900
GAACTCCATT ATAAAAGCCA TGGTTCCCCT CCTTCACATA GCCCTTTTGG TATTATTTGT   960
AATCATAATC TATGCTATTA TAGGATTGGA ACTTTTTATT GGAAAAATGC ACAAAACATG  1020
TTTTTTTGCT GACTCAGATA TCGTAGCTGA AGAGGACCCA GCTCCATGTG CGTTCTCAGG  1080
GAATGGACGC CAGTGTACTG CCAATGGCAC GGAATGTAGG AGTGGCTGGG TTGGCCCGAA  1140
CGGAGGCATC ACCAACTTTG ATAACTTTGC CTTTGCCATG CTTACTGTGT TTCAGTGCAT  1200
CACCATGGAG GGCTGGACAG ACGTGCTCTA CTGGGTAAAT GATGCGATAG GATGGGAATG  1260
GCCATGGGTG TATTTTGTTA GTCTGATCAT CCTTGGCTCA TTTTTCGTCC TTAACCTGGT  1320
TCTTGGTGTC CTTAGTGGAG AATTCTCAAA GGAAAGAGAG AAGGCAAAAG CACGGGGAGA  1380
TTTCCAGAAG CTCCGGGAGA AGCAGCAGCT GGAGGAGGAT CTAAAGGGCT ACTTGGATTG  1440
GATCACCCAA GCTGAGGACA TCGATCCGGA GAATGAGGAA GAAGGAGGAG AGGAAGGCAA  1500
ACGAAATACT AGCATGCCCA CCAGCGAGAC TGAGTCTGTG AACACAGAGA ACGTCAGCGG  1560
TGAAGGCGAG AACCGAGGCT GCTGTGGAAG TCTCTGGTGC TGGTGGAGAC GGAGAGGCGC  1620
GGCCAAGGCG GGGCCCTCTG GGTGTCGGCG GTGGGGTCAA GCCATCTCAA AATCCAAACT  1680
CAGCCGACGC TGGCGTCGCT GGAACCGATT CAATCGCAGA AGATGTAGGG CCGCCGTGAA  1740
GTCTGTCACG TTTTACTGGC TGGTTATCGT CCTGGTGTTT CTGAACACCT TAACCATTTC  1800
CTCTGAGCAC TACAATCAGC CAGATTGGTT GACACAGATT CAAGATATTG CCAACAAAGT  1860
CCTCTTGGCT CTGTTCACCT GCGAGATGCT GGTAAAAATG TACAGCTTGG GCCTCCAAGC  1920
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GACGATCCTG GTGGAACTGG AAATCATGTC TCCCCTGGGG ATCTCTGTGT TTCGGTGTGT  2040
GCGCCTCTTA AGAATCTTCA AAGTGACCAG GCACTGGACT TCCCTGAGCA ACTTAGTGGC  2100
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TATCATCTTT TCCTTGCTTG GGATGCAGCT GTTTGGCGGC AAGTTTAATT TTGATGAAAC  2220
GCAAACCAAG CGGAGCACCT TTGACAATTT CCCTCAAGCA CTTCTCACAG TGTTCCAGAT  2280
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CACTACCCTC CTGCAGTTCA TGTTTGCCTG TATCGGGGTC CAGTTGTTCA AGGGGAAGTT  3300
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TATAGACGTG GCCCTCAGCG AAGCGGACCC AACTGAAAGT GAAAATGTCC CTGTCCCAAC  4080
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TGTCATCATG GATAATTTCG ACTATCTGAC CCGGGACTGG TCTATTTTGG GGCCTCACCA  4620
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SEQ ID NO:288 PFD2 Protein sequence:
Protein Accession #: A38198

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SEQ ID NO:289 OBI6 DNA SEQUENCE

Nucleic Acid Accession#: NM_002812
Coding sequence: 150-3362 (underlined sequence corresponds to start and stop codon)

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SEQ ID NO:290 <u>OBI6 Protein sequence:</u>
Protein Accession #: NP_002812

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SEQ ID NO:291 AAB1 DNA SEQUENCE

Nucleic Acid Accession #: NM_002205
Coding sequence: 1-3150 (underlined sequences correspond to start and stop codons)

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SEQ ID NO:292 AAB1 Protein sequence:
Protein Accession #: NP_002196

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IAESYYPEYL INLVQGQLQT RQASSIYDDS YLGYSVAVGE FSGDDTEDFV AGVPKGNLTY   300
GYVTILNGSD IRSLYNFSGE QMASYFGYAV AATDVNGDGL DDLLVGAPLL MDRTPDGRPQ   360
EVGRVYVYLQ HPAGIEPTPT LTLTGHDEFG RFGSSLTPLG DLDQDGYNDV AIGAPFGGET   420
QQGVVFVFPG GPGGLGSKPS QVLQPLWAAS HTPDFFGSAL RGGRDLDGNG YPDLIVGSFG   480
VDKAVVYRGR PIVSASASLT IFPAMFNPEE RSCSLEGNPV ACINLSFCLN ASGKHVADSI   540
GFTVELQLDW QKQKGGVRRA LFLASRQATL TQTLLIQNGA REDCREMKIY LRNESEFRDK   600
LSPIHIALNF SLDPQAPVDS HGLRPALHYQ SKSRIEDKAQ ILLDCGEDNI CVPDLQLEVF   660
GEQNHVYLGD KNALNLTFHA QNVGEGGAYE AELRVTAPPE AEYSGLVRHP GNFSSLSCDY   720
FAVNQSRLLV CDLGNPMKAG ASLWGGLRFT VPHLRDTKKT IQFDFQILSK NLNNSQSDVV   780
SFRLSVEAQA QVTLNGVSKP EAVLFPVSDW HPRDQPQKEE DLGPAVHHVY ELINQGPSSI   840
SQGVLELSCP QALEGQQLLY VTRVTGLNCT TNHPINPKGL ELDPEGSLHH QQKREAPSRS   900
SASSGPQILK CPEAECFRLR CELGPLHQQE SQSLQLHFRV WAKTFLQREH QPFSLQCEAV   960
YKALKMPYRI LPRQLPQKER QVATAVQWTK AEGSYGVPLW IIILAILFGL LLLGLLIYIL  1020
YKLGFFKRSL PYGTAMEKAQ LKPPATSDA
```

SEQ ID NO:293 LBH4 DNA SEQUENCE

Nucleic Acid Accession #: BC001291
Coding sequence: 44-541 (start and stop codons are underlined)

```
1         11        21        31        41        51
|         |         |         |         |         |
GGGGGCGCCG CGCGCTGACC CTCCCTGGGC ACCGCTGGGG ACGATGGCGC TGCTCGCCTT  60
GCTGCTGGTC GTGGCCCTAC CGCGGGTGTG GACAGACGCC AACCTGACTG CGAGACAACG  120
AGATCCAGAG GACTCCCAGC GAACGGACGA GGGTGACAAT AGAGTGTGGT GTCATGTTTG  180
TGAGAGAGAA AACACTTTCG AGTGCCAGAA CCCAAGGAGG TGCAAATGGA CAGAGCCATA  240
CTGCGTTATA GCGGCCGTGA AAATATTTCC ACGTTTTTTC ATGGTTGCGA AGCAGTGCTC  300
CGCTGGTTGT GCAGCGATGG AGAGACCCAA GCCAGAGGAG AAGCGGTTTC TCCTGGAAGA  360
GCCCATGCCC TTCTTTTACC TCAAGTGTTG TAAAATTCGC TACTGCAATT TAGAGGGGCC  420
ACCTATCAAC TCATCAGTGT TCAAAGAATA TGCTGGGAGC ATGGGTGAGA GCTGTGGTGG  480
GCTGTGGCTG GCCATCCTCC TGCTGCTGGC CTCCATTGCA GCCGGCCTCA GCCTGTCTTG  540
AGCCACGGGA CTGCCACAGA CTGAGCCTTC CGGAGCATGG ACTCGCTCCA GACCGTTGTC  600
ACCTGTTGCA TTAAACTTGT TTTCTGTTGA TTACCTCTTG GTTTGACTTC CCAGGGTCTT  660
GGGATGGGAG AGTGGGGATC AGGTGCAGTT GGCTCTTAAC CCTCAAGGGT TCTTTAACTC  720
ACATTCAGAG GAAGTCCAGA TCTCCTGAGT AGTGATTTTG GTGACAAGTT TTTCTCTTTG  780
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CCTCTGAGGG CTTCAGTATT GATGGGGAGG GAGGCCTAAG TACCACTCAT GGAGAGTATG  900
TGCTGAGATG CTTCCGACCT TTCAGGTGAC GCAGGAACAC TGGGGGAGTC TGAATGATTG  960
GGGTGAAGAC ATCCCTGGAG TGAAGGACTC CTCAGCATGG GGGGCAGTGG GGCACACGTT  1020
AGGGCTGCCC CCATTCCAGT GGTGGAGGCG CTGTGGATGG CTGCTTTTCC TCAACCTTTC  1080
CTACCAGATT CCAGGAGGCA GAAGATAACT AATTGTGTTG AAGAAACTTA GACTTCACCC  1140
ACCAGCTGGC ACAGGTGCAC AGATTCATAA ATTCCCACAC GTGTGTGTTC AACATCTGAA  1200
ACTTAGGCCA AGTAGAGAGC ATCAGGGTAA ATGGCGTTCA TTTCTCTGTT AAGATGCAGC  1260
CATCCATGGG GAGCTGAGAA ATCAGACTCA AAGTTCCACC AAAAACAAAT ACAAGGGGAC  1320
TTCAAAAGTT CACGAAAAAA AAAAAAAAAA AAAAAAAAAA AAAAAAAAAA AAA
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SEQ ID NO:294 LBH4 Protein sequence:
Protein Accession #: AAH01291

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1          11         21         31         41         51
|          |          |          |          |          |
MALLALLLVV ALPRVWTDAN LTARQRDPED SQRTDEGDNR VWCHVCEREN TFECQNPRRC   60
KWTEPYCVIA AVKIFPRFFM VAKQCSAGCA AMERPKPEEK RFLLEEPMPF FYLKCCKIRY  120
CNLEGPPINS SVFKEYAGSM GESCGGLWLA ILLLLASIAA GLSLS
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It is understood that the examples described above in no way serve to limit the true scope of this invention, but rather are presented for illustrative purposes. All publications, sequences of accession numbers, and patent applications cited in this specification are herein incorporated by reference as if each individual publication or patent application were specifically and individually indicated to be incorporated by reference.

WHAT IS CLAIMED IS:

1. A method of detecting a prostate cancer-associated transcript in a cell from a patient, the method comprising contacting a biological sample from the patient with a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1-16.

2. The method of claim 1, wherein the polynucleotide selectively hybridizes to a sequence at least 95% identical to a sequence as shown in Tables 1-16.

3. The method of claim 1, wherein the biological sample is a tissue sample.

4. The method of claim 1, wherein the biological sample comprises isolated nucleic acids.

5. The method of claim 4, wherein the nucleic acids are mRNA.

6. The method of claim 4, further comprising the step of amplifying nucleic acids before the step of contacting the biological sample with the polynucleotide.

7. The method of claim 1, wherein the polynucleotide comprises a sequence as shown in Tables 1-16.

8. The method of claim 1, wherein the polynucleotide is labeled.

9. The method of claim 8, wherein the label is a fluorescent label.

10. The method of claim 1, wherein the polynucleotide is immobilized on a solid surface.

11. The method of claim 1, wherein the patient is undergoing a therapeutic regimen to treat prostate cancer.

12. The method of claim 1, wherein the patient is suspected of having prostate cancer.

13. A method of monitoring the efficacy of a therapeutic treatment of prostate cancer, the method comprising the steps of:

(i) providing a biological sample from a patient undergoing the therapeutic treatment; and

(ii) determining the level of a prostate cancer-associated transcript in the biological sample by contacting the biological sample with a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1-16, thereby monitoring the efficacy of the therapy.

14. The method of claim 13, further comprising the step of: (iii) comparing the level of the prostate cancer-associated transcript to a level of the prostate cancer-associated transcript in a biological sample from the patient prior to, or earlier in, the therapeutic treatment.

15. The method of claim 13, wherein the patient is a human.

16. A method of monitoring the efficacy of a therapeutic treatment of prostate cancer, the method comprising the steps of:

(i) providing a biological sample from a patient undergoing the therapeutic treatment; and

(ii) determining the level of a prostate cancer-associated antibody in the biological sample by contacting the biological sample with a polypeptide encoded by a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1-16, wherein the polypeptide specifically binds to the prostate cancer-associated antibody, thereby monitoring the efficacy of the therapy.

17. The method of claim 16, further comprising the step of: (iii) comparing the level of the prostate cancer-associated antibody to a level of the prostate cancer-associated antibody in a biological sample from the patient prior to, or earlier in, the therapeutic treatment.

18. The method of claim 16, wherein the patient is a human.

19. A method of monitoring the efficacy of a therapeutic treatment of prostate cancer, the method comprising the steps of:

(i) providing a biological sample from a patient undergoing the therapeutic treatment; and

(ii) determining the level of a prostate cancer-associated polypeptide in the biological sample by contacting the biological sample with an antibody, wherein the antibody specifically binds to a polypeptide encoded by a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1-16, thereby monitoring the efficacy of the therapy.

20. The method of claim 19, further comprising the step of: (iii) comparing the level of the prostate cancer-associated polypeptide to a level of the prostate cancer-associated polypeptide in a biological sample from the patient prior to, or earlier in, the therapeutic treatment.

21. The method of claim 19, wherein the patient is a human.

22. An isolated nucleic acid molecule consisting of a polynucleotide sequence as shown in Tables 1-16.

23. The nucleic acid molecule of claim 22, which is labeled.

24. The nucleic acid of claim 23, wherein the label is a fluorescent label

25. An expression vector comprising the nucleic acid of claim 22.

26. A host cell comprising the expression vector of claim 25.

27. An isolated polypeptide which is encoded by a nucleic acid molecule having polynucleotide sequence as shown in Tables 1-16.

28. An antibody that specifically binds a polypeptide of claim 27.

29. The antibody of claim 28, further conjugated to an effector component.

30. The antibody of claim 29, wherein the effector component is a fluorescent label.

31. The antibody of claim 29, wherein the effector component is a radioisotope or a cytotoxic chemical.

32. The antibody of claim 29, which is an antibody fragment.

33. The antibody of claim 29, which is a humanized antibody

34. A method of detecting a prostate cancer cell in a biological sample from a patient, the method comprising contacting the biological sample with an antibody of claim 28.

35. The method of claim 34, wherein the antibody is further conjugated to an effector component.

36. The method of claim 35, wherein the effector component is a fluorescent label.

37. A method of detecting antibodies specific to prostate cancer in a patient, the method comprising contacting a biological sample from the patient with a polypeptide encoded by a nucleic acid comprises a sequence from Tables 1-16.

38. A method for identifying a compound that modulates a prostate cancer-associated polypeptide, the method comprising the steps of:

(i) contacting the compound with a prostate cancer-associated polypeptide, the polypeptide encoded by a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1-16; and

(ii) determining the functional effect of the compound upon the polypeptide.

39. The method of claim 38, wherein the functional effect is a physical effect.

40. The method of claim 38, wherein the functional effect is a chemical effect.

41. The method of claim 38, wherein the polypeptide is expressed in a eukaryotic host cell or cell membrane.

42. The method of claim 38, wherein the functional effect is determined by measuring ligand binding to the polypeptide.

43. The method of claim 38, wherein the polypeptide is recombinant.

44. A method of inhibiting proliferation of a prostate cancer-associated cell to treat prostate cancer in a patient, the method comprising the step of administering to the subject a therapeutically effective amount of a compound identified using the method of claim 38.

45. The method of claim 44, wherein the compound is an antibody.

46. The method of claim 45, wherein the patient is a human.

47. A drug screening assay comprising the steps of

(i) administering a test compound to a mammal having prostate cancer or a cell isolated therefrom;

(ii) comparing the level of gene expression of a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1-16 in a treated cell or mammal with the level of gene expression of the polynucleotide in a control cell or mammal, wherein a test compound that modulates the level of expression of the polynucleotide is a candidate for the treatment of prostate cancer.

48. The assay of claim 47, wherein the control is a mammal with prostate cancer or a cell therefrom that has not been treated with the test compound.

49. The assay of claim 47, wherein the control is a normal cell or mammal.

50. A method for treating a mammal having prostate cancer comprising administering a compound identified by the assay of claim 47.

51. A pharmaceutical composition for treating a mammal having prostate cancer, the composition comprising a compound identified by the assay of claim 47 and a physiologically acceptable excipient.

52. The method according to claim 1,wherein said biological sample is contacted with a plurality of polynucleotides comprising a first polynucleotide that selectively hybridizes to a sequence at least 80% identical to a first sequence as shown in Tables 1-16; and a second polynucleotide that selectively hybridizes to a second sequence at least 80% identical to a second sequence as shown in Tables 1-16.

53. A method according to claim 52, wherein the plurality of polynucleotides comprises a third polynucleotide that selectively hybridizes to a sequence at least 80% identical to a third sequence as shown in Tables 1-16..

54. A method of detecting a prostate cancer associated transcript, the method comprising contacting a biological sample from the patient with a plurality of polynucleotides wherein at least two of said polynucleotides selectively hybridize to a difference sequence at least 80% identical to a sequence as shown in Tables 1-16.

55. A method of detecting a prostate cancer, the method comprising the steps of:

(i) providing a biological sample from a patient;

(ii) contacting the biological sample with a first polynucleotide that selectively hybridizes to a sequence at least 80% identical to a first sequence as shown in Tables 1-16 to determine the level of a prostate cancer-associated transcript in the biological sample; and with a second polynucleotide that selectively hybridizes to a second sequence at least 80% identical to a sequence not shown in Tables 1-16; wherein the expression of said second sequence is not substantially changed in prostate cancer, to detemine the level of expression of a control transcript in the biological sample;

(iii) comparing the level of the prostate cancer-associated transcript to a level of the normal tissue associated transcript in the biological sample.

56. A method of quantitating a prostate cancer-associated transcript in a cell from a patient, the method comprising contacting a biological sample from the patient with a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1-16.

57. The method of claim 56, wherein the polynucleotide selectively hybridizes to a sequence at least 95% identical to a sequence as shown in Tables 1-16.

58. The method of claim 56, wherein the biological sample is a tissue sample.

59. The method of claim 56, wherein the biological sample comprises isolated nucleic acids.

60. The method of claim 56, wherein the nucleic acids are mRNA.

61. The method of claim 59, further comprising the step of amplifying nucleic acids before the step of contacting the biological sample with the polynucleotide.

62. The method of claim 56, wherein the polynucleotide comprises a sequence as shown in Tables 1-16.

63. The method of claim 56, wherein the polynucleotide is labeled.

64. The method of claim 63, wherein the label is a fluorescent label.

65. The method of claim 56, wherein the polynucleotide is immobilized on a solid surface.

66. The method of claim 56, wherein the patient is undergoing a therapeutic regimen to treat metastatic prostate cancer.

67. The method of claim 56, wherein the patient is suspected of having metastatic prostate cancer.

68. A biochip comprising a plurality of polynucleotides that selectively hybridize to a sequence at least 80% identical to a sequence as shown in Tables 1-16.

69. A method of screening drug candidates comprising:

i) providing a cell that expresses an expression profile gene selected from the group consisting of an expression profile gene set forth in Tables 1-16 or fragment thereof;

ii) adding a drug candidate to said cell; and

iii) determining the effect of said drug candidate on the expression of said expression profile gene.

70. A method according to claim 59 wherein said determining comprises comparing the level of expression in the absence of said drug candidate to the level of expression in the presence of said drug candidate.

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